The Newsweekly for Information Technology Leaders
September 30, 1996, Vol. 30, No. 40, 166 Pages, $3/Copy, $48/Year

COMPUTERWORLD

News updates, features, forums: www.computerworld.com

Boosting Basic

Microsoft to give Visual Basic 'net upgrade in duel with Java

By Sharon Gaudin
ORLANDO, FLA

Microsoft Corp. is retooling its Visual Basic application development software for the Internet in a campaign some say is an attempt to keep users from switching to Sun Microsystems, Inc.'s Java.

At the Visual Basic Insiders' Technical Summit held here last week, Microsoft gave about 2,000 Visual Basic developers a sneak preview of coming enhancements. Most will be included in Version 5, due out by year's end.

New Technology Solutions' Dan Mezick: *Visual Basic 5 will be a bridge to the Internet*

"Visual Basic programmers need to be inducted onto the Internet with as little pain as possible. This is the bridge to the Internet for them," said Dan Mezick, a Visual Basic trainer at New Technology Solutions in North Haven, Conn.

"IS managers need to get their corporate developers building applications for the Internet without having them trained in another lan-

Visual Basic, *page 16*

Risk-taking speeds merger

Wells Fargo to save $800M in acquisition

By Thomas Hoffman
SAN FRANCISCO

Two million customers, 405 branch offices and 775 automated teller machines — in 132 days.

Thanks to a risk-taking strategy and the benefits of TCP/IP networking, that's how long it took Wells Fargo Bank to absorb First Interstate Bancorp's California operations following its $13.2 billion takeover April 1.

The project wasn't without glitches. But it went well, considering that it typically takes two years to combine the operations of two $50 billion

Wells Fargo, *page 119*

Blind users stymied by new Internet graphics

By Mindy Blodgett

For Sue Martin, a rehabilitation teacher in Bangor, Maine, who is blind, text-based Internet sites opened a world of information that was previously off-limits.

With the World Wide Web, she's not so lucky.

As companies put applications on graphics-intensive intranets and Web sites, they may be shutting the door on people — employees and customers — who are sight-impaired.

Many blind people use text-to-speech "screen readers" that work only with the character-based DOS operating system, not with graphical

Blind users, *page 16*

Sue Martin: *It's 'incredibly difficult' to use the Web without DOS*

SGI defends low end against Windows NT

By Jaikumar Vijayan

Silicon Graphics, Inc. is preparing a series of servers and workstations in a major revamp of its entire product line, *Computerworld* has learned.

But a recently discovered flaw in one of the chips that power the systems threatens to rain on SGI's parade.

SGI plans to roll out a line of symmetrical multiprocessing servers that feature an architecture called SNX, which provides high I/O bandwidth and processor and memory scalability. SGI is also prepping an early-October release of a line of low-cost, graphics-intensive workstations, code-named Moosehead, in a bid to fend off a low-end challenge by Intel-based Windows NT boxes.

SGI, *page 15*

Networking Sound Off!

Will switches deliver a knockout blow, or are the latest routers poised to fight back? BBN's **Scott Marcus** (left) and Cabletron's **Trent Waterhouse** (right) duke it out.

In Depth, page 93

Newspaper
#BXBBJFT# ********** CAR-RT SORT ** C035
#40103UIV3000R0038 JUL 96 001 008757
UNIVERSITY MICROFILMS INT 0000
SERIAL PUBLICATIONS
300 N ZEEB RD 14
ANN ARBOR MI 40103-1500

Avoid a holy war

The computer industry has finally agreed that PCs cost too damn much to use. But the radically different solutions that vendors propose may touch off another ugly confrontation between users and information systems.

IS has watched in alarm as "soft" costs, such as support, maintenance and training, have driven the annual cost of owning a PC to three to four times the machine's purchase price. An IS manager at a large company recently told me that it takes his group so long to upgrade users to the newest release of Microsoft Office that by the time they're finished, a new version has come out.

The computer industry has proposed two basic solutions to this problem. The network computing faction says you should administer all your software from humongous servers. The personal computing faction says the solution to desktop complexity is *more* software. Stick a bunch of probes, monitors and utilities on each PC, and use the network to track but not control. Intel even joined that band last week by introducing — surprise! — a chip for systems diagnosis. (See story, page 10.)

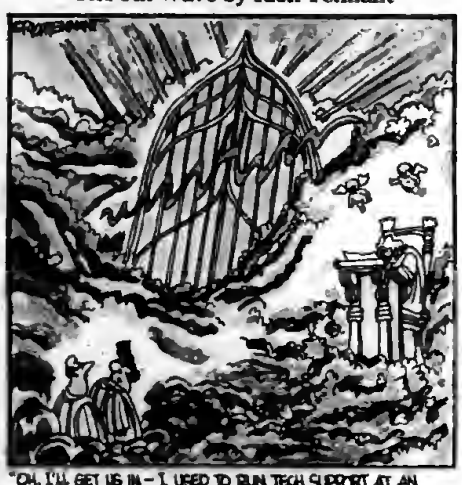
Both sides have a reasonable argument, and that's the problem. IS managers love the network computing approach because it gives them control over a situation that has gotten way out of hand. But PC power users will no more accede to what they perceive as IS tyranny than my 4-year-old will eat broccoli.

So a standoff is brewing between IS and its most zealous users. The "fat client" solution from the Intel/Microsoft camp sets up corporate IS as the bad guy. You can't mandate network computers without risking a user revolt, so don't even try.

If you think network computers make sense, start slow — like with the 60% of users who don't care where their data goes. If the idea is good, others will come on board in time. But don't get caught in another industry holy war backed by vendors who use confusion as a weapon to sell more products.

Paul Gillin, Editor
Internet: paul_gillin@cw.com
www.ultranet.com/~pgillin

The 5th Wave by Rich Tennant



Tool links Web to databases

By Mitch Wagner

Open Market, Inc. plans today to announce a tool kit designed to bolster online commerce by linking World Wide Web sites to databases that reside on an intranet or host-based legacy systems, *Computerworld* has learned.

ActiveCommerce DB will let users keep sites fresh with up-to-the-minute information gleaned from the same databases used to drive a company's business functions.

The kit links to Oracle Corp. or Sybase, Inc. databases. Applications can be developed using standard development tools such as PowerBuilder from the Powersoft Corp. unit of Sybase, Inc. or WebObjects from Next Software, Inc.

ActiveCommerce sites can include live, real-time information from internal corporate product catalogs, inventories or customer lists, an Open Market official said.

User Shel Kaphan, vice president of research and development at online bookstore Amazon.Com, Inc., said, "If you can keep connections to the database open, that's a big win." Amazon.Com has tools similar to Open Market's.

The software costs $2,995 per developer seat and will be available in November. It runs on major Unix platforms; Windows NT support will come later.

Open Market faces stiff competition from Oracle, Sybase and Informix Corp. Likewise, Netscape Communications Corp.'s merchant server offers competitive functionality, as will forthcoming products from Microsoft Corp. and IBM.

But Open Market's strength is the product's functionality and ability to work with popular third-party developer's tools. Moreover, combining ActiveCommerce with Open Market's user-authentication and payment-processing tools gives Open Market an effective product set, said analyst Stan Lepeak at Meta Group, Inc. in Stamford, Conn.

"Functionality is not Open Market's problem," Lepeak said. "Their problem is getting users to know who they are."

News Shorts

Cabletron makes buy

Cabletron Systems, Inc. last week announced plans to acquire **Netlink, Inc.** in Framingham, Mass., for $160 million in stock. Netlink makes frame-relay access devices. The acquisition is expected to be completed by year's end. Cabletron intends to operate Netlink — which employs roughly 80 people — as a stand-alone business unit.

NetWare tool coming

Managers of **Novell, Inc.** servers can download and test a tool to centrally manage all the NetWare Loadable Module applications loaded on servers throughout a network. A beta version of **NetPro Computing, Inc.**'s Config Central is available at www.netpro.com. The product will ship in October for $499.

Timing is everything

Timely delivery of data to business managers is the top concern of most information systems executives, according to a survey slated for release today by **Find/SVP** in New York and **EMC Corp.** in Hopkinton, Mass. Most IS managers are also worried about their inability to manage scattered data stores, the survey found.

Smart phones on tap

Bell Atlantic Nynex Mobile has announced Cellscape, a mobile data communications service for smart phones that will be available by year's end. Prices aren't yet available but are expected to run between $25 and $30 per month.

Cisco improves nets

Cisco Systems, Inc. last week announced Release 4.0 of its MultiNet for OpenVMS gateway software, letting users tie **Digital Equipment Corp.** VAX and Alpha-based systems to corporate IP networks and the Internet. Release 4.0 is available, starting at $37,000 for a 25-system license.

Oracle going visual

Oracle Corp. has begun testing a new version of its Oracle 2000 visual development tool set. Developer 2000 2.0 runs on Windows 3.1, Windows 95, Windows NT, Macintosh, OS/2 and Unix. It includes wizards to guide developers through the process of building database connections. The final version, slated to ship by year's end, will also generate Java applications.

WRQ expands

WRQ, Inc., a vendor of TCP/IP tools and enterprise connectivity software, last week acquired **Express Systems, Inc.** for an undisclosed sum. As a first step into the software management market, the Seattle-based vendor next month will begin selling and supporting the Express Meter tool for tracking application usage by networked PCs.

Platinum ships tool set

Platinum Technology, Inc. this week will roll out Netcessities, a $2,995 Windows 95-based suite for building Internet-based applications. The tool set can generate Hypertext Markup Language pages as well as 32-bit Windows applications and comes bundled with Platinum's analysis and design tool and development environment. Support for Java will be added by the middle of next year.

Artisoft lays off 50

Officials at **Artisoft, Inc.**, the lone remaining peer-to-peer network operating system vendor, said last week the company will lay off 50 people — about 15% of its workforce — due to declining demand for its LANtastic product line. LANtastic still accounts for 70% of the company's business.

Open Group merge

The Open Group consortium is announcing today that it signed a preliminary deal to absorb **Uni-Forum Association**, a group of Unix-oriented users and developers. The two groups expect to combine staff and operations by next March.

SHORT TAKES This week, **Technically Elite, Inc.** will launch a Remote Monitor probe for watching backbone traffic for $7,495. ... **Lucent Technologies, Inc.** plans to announce a line of optical and intelligent character recognition data entry products for fax, handwriting and table reading at Imaging Expo '96 in New York this week. ... **Nat Systems International, Inc.** in McLean, Va., last week named former Apple Computer, Inc. executive Daniel Eilers as president and CEO.

Real World Interface

Now, you can actually "fly" through your enterprise and fix problems without ever leaving your desk

[illegible] ke o actually fly through [illegible] to find and even fix problems [illegible] — w thout ever leaving your de [illegible] It s It s just one of many un [illegible] s of the new CA-Unicenter TN [illegible] TNG s the first open and [illegible] that covers all of your exist g s [illegible] and applications All [illegible] your IT resources [illegible] CA Unicenter TNG ma [illegible] ss Process View [illegible] business perspe [illegible] nformation into in [illegible]

Call 1-800-654-6118 For A Free TNG Video And To Register For A Seminar. Or Visit Us At http://www.cai.com

Cal today to learn more about the single [illegible] on for End-to-End Management It s the te [illegible] t morrow — that s available today

COMPUTER ASSOCIATES

New CA-Unicenter TNG

©1996 Computer A [illegible]

A PUBLICATION OF IDG

In This Issue

Sept. 30, 1996

News

NEWS

6 AbsentX
Absence of key users and Open Group pact raise doubts about Microsoft's "open" ActiveX policy.

6 AntiX
Oracle aims at Microsoft with CORBA-based multiplatform object framework.

8 Mondo computing
Public/private group to build $100 million meta-service bureau in Philadelphia.

20 Reducing maintenance
Intel plan could cut PC costs 15% but requires upgrades to Pentium chips.

OPINION

32 Video veto
Desktop video won't take off as long as users want in-cubicle privacy, Neal Weinberg says.

36 Memo to Lou
If IBM wants leadership, it should buy Netscape, David Moschella advises.

121 Secure those 'nets
In the mad dash to intranets, don't forget about security, Charles Babcock warns.

Technical Sections

SOFTWARE

49 Enterprise Java
Symantec adds team development tweaks to Java tool set.

50 Office 97 review
New package redefines how organized suites can be.

THE ENTERPRISE NETWORK

55 Ethernet desktops
Despite the hype, ATM can't match Ethernet ease at the desktop.

THE INTERNET

61 That's MYdomain.com
The fight for domain names is lucrative for some, sleazy to others.

61 Multimedia on the Web
Streaming video and audio are pretty, but can they earn their keep?

CORPORATE STRATEGIES

65 Matchmaking
Recruiting firm slashes job search time with database on the Web.

65 Animals online
San Diego Zoo aims to bring its menagerie to the Web.

Features

MANAGING

73 Year 2000 scoreboard
Tips, techniques and news on the conversion to the new millennium.

81 Muffling grumblers
IS managers can turn user gripes and hostility into constructive energy.

BUYER'S GUIDE

82 Grappling with groupware
Computerworld survey offers advice, tips and evaluations of groupware choices.

IN DEPTH

93 Sound off
Will switches rout routers in the internetworking market?

CAREERS

98 Working NT
Suddenly, NT is an operating system you can build a career on.

MARKETPLACE

110 Unix Expo Plus
See what your peers expect to gain from attending this conference.

Etc.

Company Index ____ 117
Editorial/Letters ____ 32
How to contact CW ____ 117
Inside Lines ____ 122
Stock Ticker ____ 116

IBM upgrades OS/2, denies demise rumor

By Justin Hibbard and Lisa Picarille
SAN FRANCISCO

Operating systems

At the official launch last week of OS/2 Warp 4, IBM appeared to solve the operating system's major technical shortcoming — its inability to run 32-bit Windows applications.

But the announcement was upstaged by rumors that this would be IBM's last major revision of OS/2 and dampened by analyst predictions that even the new features in OS/2 Warp 4, code-named Merlin, would do little to lift market share.

IBM announced that OS/2 Warp 4 will support Citrix Systems, Inc.'s Intelligent Console Architecture (ICA) client software. Application logic will run on Citrix's WinFrame/Enterprise 1.6 server, which then distributes user interfaces from Windows 95 and Windows NT applications to desktops that run Citrix's ICA client on top of OS/2 Warp 4.

Longtime OS/2 fans applauded the announcement. Bob Moxham, an information systems manager at BankAmerica Corp. in San Francisco, said the ICA support is good news for users like him, who insist on using OS/2 even though BankAmerica has standardized on Windows NT Workstation. "I'm an OS/2 bigot," he said. "I want to make sure I can run 32-bit applications in OS/2."

OS/2's inability to run popular Windows applications had prompted David Card, an analyst at International Data Corp. in Mountain View, Calif., a week earlier to predict little growth in OS/2's market share in the next year.

When IBM announced the support for ICA, Card said it sounded like "a sensible strategy." But it didn't change his forecast. "It's more of a way to address somebody who has OS/2 already," he said.

Even IBM officials didn't argue the point. "OS/2's dominant position has always been line-of-business applications," said Steven Mills, general manager of software solutions at IBM. Support for 32-bit personal productivity applications will offer added value to customers who use OS/2 primarily for industry-specific applications, Mills said.

There were reports last week that Warp 4 will be the final major upgrade to OS/2. Several OS/2 engineers at IBM's development facility in Austin, Texas, said they are being encouraged to circulate their resumes within IBM.

Dave Barnes, senior product manager in IBM's Personal Software Products division, said IBM isn't planning to enhance the OS/2 Warp kernel but will continue to "release functional enhancements to the operating system as needed."

Warp speed

"This is by no means the end of OS/2 Warp," Barnes said. "But considering how fast the industry is moving — a [World Wide] Web year is measured in three months — we are changing the paradigm of how we release [operating system] enhancements."

He said some engineers in the group may have received offers to take early retirement or move to another group, but it was due to "natural attrition" and wasn't specific to the OS/2 Warp group.

"We've got 14 million OS/2 Warp users, and it's unfathomable that we would abandon the [operating system] when so many people rely on it," Barnes said.

Shaku Atre, president of The Atre Group, Inc. in Port Chester, N.Y., said IBM is unlikely to drop OS/2 altogether because the product is used by IBM's most valuable customers — Fortune 100 corporations. "They can't leave those companies in the dark," Atre said. "I think IBM will keep coming up with new features."

— Senior editor Laura DiDio contributed to this report.

Sonny Williams

Managing

CIOs in it for the long haul.

Most of their peers may move on more quickly, but some CIOs have happily worked at one desk for at least seven years. Some share their survival secrets.

Page 72.

COME VISIT OUR WEB SITE
COMPUTERWORLD

Year 2000 Scoreboard
Scoreboard tracks the issues, dishes the facts and helps you find the pot of gold at the end of the millennium.

QuickPoll: Warp 4 and out?
Let IBM know whether or not you think it should pull the plug on OS/2.
www.computerworld.com

Forum: User hostility
IS managers who have faced hostile user audiences say there are ways to channel that hostility constructively. Join Naomi Karten.
www.computerworld.com/forums/

5 Days. 360 Sessions. 260 Exhibits. One Conference.

Oracle OpenWorld

Robert Palmer
President & CEO,
Digital Equipment Corp.

Lewis E. Platt
President & CEO,
Hewlett-Packard Co.

Larry Ellison
CEO, Oracle Corporation

Scott G. McNealy
President & CEO,
Sun Microsystems, Inc.

Marco Landi
Executive VP & CEO,
Apple Computer, Inc.

- Implementation Stories
- DBA Tips
- OLAP Integration
- Data Warehousing
- Internet / Intranet Deployment
- Oracle Applications

- Client/Server Development
- Web Development
- Object-Oriented Technology
- Java Development
- Application Modeling and Generation
- NT Solutions
- Tips & Tricks from the Masters

- 250+ hardware and software companies' exhibits
- Direct contact with Oracle product developers
- Oracle Education classes
- Interaction with peers from around the world

NOVEMBER 3-8, MOSCONE CENTER, SAN FRANCISCO

Come together with the world's foremost users, developers and technology partners at this premier conference and exposition. Learn about Oracle's latest software, products and related technologies. And get ready to go beyond the limits of today's software technology.

Call 1.800.304.4664, or find us on the Web at http://www.oracle.com/openworld

Sponsored by HEWLETT PACKARD · Sun · digital · Apple Computer, Inc.

©1996 Oracle Corporation. Oracle is a registered trademark of Oracle Corporation. All rights reserved. All other company and product names are trademarks of their respective owners.

Done deal dampens summit on ActiveX

In pact with Open Group, Microsoft falls short on promise to relinquish control

By Frank Hayes and Craig Stedman

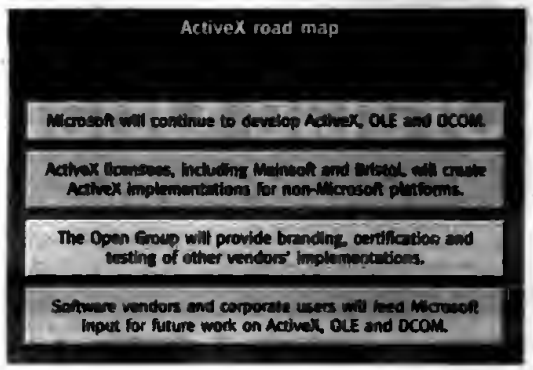
When Microsoft Corp. holds its much-ballyhooed ActiveX summit with corporate users and software vendors this week in New York, some of the chairs reserved for large corporate developers will be empty. And some parts of the process for giving outsiders more control of Microsoft's object technologies may already be a done deal.

Several companies that Microsoft previously announced would join the four-hour meeting on Oct. 1 — including Phillips Petroleum Co., 3M Co. and Merrill Lynch & Co. — said last week that their key object-technology people don't plan to attend the meeting.

"They sent us a questionnaire and asked us if we were interested in this [ActiveX] technology, and we simply responded saying, 'Yeah, we're interested in that.' But we did not commit to participate or even attend the Oct. 1 meeting. At this point, we don't definitely have anybody who's packed their bags and going," a spokesman at Phillips said.

"We're definitely interested in object orientation — that is definitely on the radar screen for us," a Merrill Lynch spokeswoman said. "But none of our top object guys are attending."

Industry sources also said last week that Microsoft has already cut a deal with The Open Group in Cambridge, Mass., to handle branding, certification and testing of other vendors' implementations of its ActiveX object development framework.



Microsoft product manager Coroelius Willis insisted that several proposals will be presented to vendors and users at the meeting Tuesday, where the company will discuss its promise to open ActiveX and its underlying OLE techoology to industry control.

More than 100 users and software vendors were invited to attend, including Netscape Communications Corp. and Oracle Corp., which are less than friendly toward Microsoft.

But the shortfall in corporate user participation — and the prearranged deal with The Open Group — amplifies questions about how willing Microsoft is to relinquish sole control of its object technology specifications.

Microsoft unbound

"Customers want to see to what degree Microsoft is willing to be bouod by recommendations of this group they'd like to form," said Steve Muench, an Oracle product manager who plans to attend the meeting. "We'd like to take Microsoft at its word, but we'll have to see whether they're really serious about this."

Microsoft originally announced last mooth that it would hand over control of ActiveX, as well as OLE and its Distributed Component Object Model (DCOM), to an outside standards group to encourage their use on non-Microsoft platforms. A meeting with users and vendors moderated by The Burton Group, a consultancy in Midvale, Utah, was set for late August, but that schedule slipped to this week.

The certification work that is reportedly being banded off to The Open Group involves only ensuring that third-party ActiveX implementations hew to those specifications. The Open Group already provides certification and branding services for Unix and will soon provide similar services for Object Management Group's Common Object Request Broker Architecture, wbich competes with Microsoft's object technologies. A deal with Microsoft would pave the way for a similar program for ActiveX.

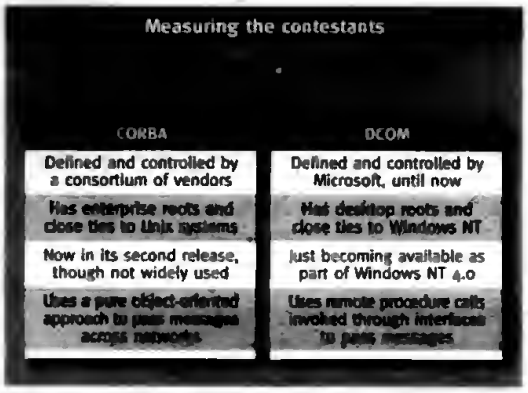
Oracle deals distributed computing hand

By Craig Stedman

Laying down its bet for enabling Internet-based distributed computing, Oracle Corp. today will detail plans for a cross-platform network infrastructure built on Object Management Group's CORBA technology.

Besides Netscape Communications Corp., which embraced Common Object Request Broker Architecture (CORBA) during the summer, Oracle is the first vendor to commit lock, stock and barrel to the technology as its distributed computing cornerstone, according to industry observers.

CORBA is a fierce rival to an approach developed by Microsoft Corp. But Oracle is somewhat hedging its bets by including links to Microsoft's Distributed Component Object Model (DCOM) and its ActiveX object development framework.



Network architecture

Microsoft and the CORBA camp both want to provide object buses that transparently connect PCs and World Wide Web browsers to client/server systems and mainframes across distributed networks.

The promise is that customers could quickly deploy applications and rely on the underlying middleware to coonect users to data.

Oracle's Network Computing Architecture will mix a CORBA-based object engine with a new plug-in "cartridge" capability that lets osers add individual pieces of functionality to their applicatioos.

Several Oracle customers said last week that the plans sound intriguing.

"When you're distributing things today, applicatioo developers have to be concerned about where the data is," said Hugh Allan, database manager at Dunlop Tire Co. in Amherst, N.Y. "If they could really simplify that, it would make things a lot easier for our staff."

Dunlop, which runs 35 Oracle databases with a total of about 400G bytes of data, can make access "somewhat transparent" by building its own database links, Allan said. But even that spproach requires extra work that might be avoided if Oracle follows through on its promises, he added.

Oracle's planned support for plug-in modules could provide a fast and flexible way to slap applications together "as opposed to writing all this stuff from scratch," said Michael Prince, manageme ot informatioo systems director at Burlington Coat Factory Warehouse Corp. in Burlington, N.J.

The use of an open technology sucb as CORBA as the core of Oracle's scheme is also "something that's really important to me," Prince said. "We don't want to be locked in to something where all the desktop clients have to be running on Microsoft operating systems. That's not our style at all."

Mark Jarvis, vice president of server technologies marketing at Oracle, said the new architecture will support SQL, ActiveX, Java and CORBA-compliant Netscape applications. All of Oracle's products will eventually be hooked in, with initial shipments due in the next three to six months, he said.

Industry sources said Oracle's OpenORB object request broker is due to ship early next year as part of its WebServer software. Later, OpenORB will be the backbone of a new Universal Application Server that supports plug-ins providing services such as messaging, transaction processing aod security, the sources said.

The architecture "is critical to Oracle's strategy" for competing with Microsoft, said Donald A. DePalma, an analyst at Forrester Research, Inc. in Cambridge, Mass. "But the nut they've got to crack is to convince the world that this isn't just something for committed Oracle-centric customers."

Correction

The computer industry was abuzz last week about the mysterious placement of the solitary number 20 on the front page of the Sept. 23 *Computerworld*. Was it the number of letters in some CIO's name? The size of Bill Gates' fortune times 10^9? A tasteless joke on the numbers missing from two-digit Cobol date fields?

Nothing so exotic. It was a printer's error on an illustration indexing our story on 20 ways to avoid getting hyped. The correct graphic is above.

Get Started Today With Micro Focus Challenge 2000

Now you can stop your century date change problem in its tracks. And there's only one set of tools that lets you do it yourself.

Micro Focus Revolve® and the Year 2000 Add-On™ provide all the tools you need to quickly and efficiently identify and fix your date problems across an entire system—all from within a single window on your PC. Then, you can compile and test changes back on the mainframe, or add the Year 2000 Compile and Test Option package to test those systems on the PC before sending them back up to your mainframe for production.

You can even choose to use Micro Focus' Challenge 2000 Consulting Services for project management expertise and expert training courses—all scaled to meet your individual needs.

You know us. As the 20-year leader in tools and services for developing and maintaining legacy systems, Micro Focus isn't about to let you get trampled by this oncoming problem. Let's head it off together right now.

Call Micro Focus and order Revolve and the Year 2000 Add-On package today. It's the only solution you need. Call 1-800-632-6265 or visit us at http://www.microfocus.com.

Transforming Enterprise Systems **MICRO FOCUS®**

©1996 Micro Focus Ltd. Micro Focus is a registered trademark. Revolve is a registered trademark of Burl Software. The Year 2000 Add-On is a trademark of Micro Focus.

States to share 'meta-cluster'

By Gary H. Anthes

Fearful that their region will become "the technological Rust Belt of the 21st century," business and government leaders from Greater Philadelphia and the Delaware Valley last week announced a plan to build a four-state "meta-computer cluster."

The cluster, which will operate as a commercial service bureau, will be able to store and process thousands of terabytes (petabytes) of information and will be geared for applications such as data mining, medical imaging, digital libraries and scientific computing.

Distributed computing

Companies will be able to access, on a services basis, huge computer capacity to meet peak needs without having to invest in equipment, its sponsors said.

Customer information

QVC, Inc., the $1.6 billion cable shopping network based in West Chester, Pa., plans to use the facility for mining databases with as much as 5T bytes of data on its customers' buying habits. "We can't keep enough data online now, and there are projects that would be enhanced by having much more data," said George Graves, chief technologist at QVC. "But to do that in-house would be so immense investment for infrequent kinds of research."

U.S. Rep. Curt Weldon (R-Pa.), the main sponsor of the project, said its $100 million capital investment will be funded equally by the federal government, state and local governments and the private sector. Key corporate sponsors so far include IBM, Lockheed Martin Corp. and Bell Atlantic Corp.

The cluster will consist of several computer centers linked by a high-speed network. It will provide services to businesses, schools and hospitals in Pennsylvania, New Jersey, Delaware and Maryland.

The meta-cluster will be built around a computer center in Philadelphia populated by IBM SP2 scalable parallel machines and high-performance clustered workstations from Silicon Graphics, Inc.

Attached disks will support 1T byte of online storage, and a robotic tape unit will hold a petabyte of off-line storage, said Robert Hollebeek, a physics professor at the University of Pennsylvania and co-chairman of the Weldon Working Group, which is kicking off the project.

Hollebeek said the computer center will be able to transfer 10T bytes of data per day into and out of the region via 10 155M bit/sec. Asynchronous Transfer Mode lines that connect to various commercial and private Internet backbones. It will also provide lower-speed connections to 10 or so subcenters designed to service particular locations or industries. For example, a subcenter might support some combination of the 125 hospitals in the region.

U.S. Rep. Curt Weldon *is the main sponsor of the meta-cluster*

What the doctor ordered

Reuben Mezrich, chairman of the University of Pennsylvania Medical Center's Department of Radiology, said the system will support "digital medicine, a fundamental change in medical practice."

For example, he said, "A trauma surgeon with a patient with multiorgan injuries could receive immediate advice from several [remote] specialists, each having access to all relevant information at the same time."

Mezrich said his unit alone generates 6T bytes of data per year. "The system will have to handle thousands of terabytes, which clearly indicates the need for aggressive development," he said.

That need will be met, Hollebeek said. He said the project can proceed quickly because it will use commercially available, off-the-shelf technology and because the hardware is scalable.

Some equipment will be installed in the Philadelphia hub this month, Hollebeek said. By the end of the year, he said, at least one 16-processor IBM SP2 box, 2T or 3T bytes of online storage and the first parts of a robotic tape library will be in place.

Weldon said he has asked research-oriented agencies such as the National Science Foundation, the Defense Advanced Research Projects Agency and the U.S. Department of Energy — some of whose budgets he controls through committee assignments — to find funds for the project in their existing budgets.

"That is in no way unrealistic," Weldon said.

Tivoli extends IBM's NetView support

By Patrick Dryden

Now that Tivoli Systems, Inc. is guiding IBM's network and systems management efforts, "multiplatform support" entails more than Big Blue boxes.

This week, Tivoli will roll out the NetView network monitor as a native server on Microsoft Corp. Windows NT and as a midlevel manager on six platforms.

That means users can manage a network with as many as 15,000 elements from one NetView for NT server. Or users can build a hierarchy of NetView platforms within an enterprise network.

"We want to put the NT version in campus pockets throughout the state as we distribute network management, if it's as powerful yet easy to run as promised," said Jerry Wetherington, systems coordinator at the University of Florida regional data center in Gainesville.

NetView midlevel manager support is available now for Sun Microsystems, Inc. Solaris, Windows NT, IBM AIX and OS/2, Hewlett-Packard Co. HP-UX and Digital Equipment Corp. Unix.

And in early 1997, Tivoli plans to support NetView as a server on Solaris and offer a World Wide Web interface for spreading access to NetView reports.

> "This will help us centrally run a TME 10 function like software distribution [so] each network is ready to handle delivery."
>
> *— Jerry Wetherington, University of Florida*

"IBM is getting into real-world support now," said Tim Wilson, management analyst at Decisys, Inc., a consultancy in Sterling, Va.

NetView for NT is available this week for $15,000. It makes full use of Windows NT's functioos and interface to reduce training requirements, according to officials at Tivoli in Austin, Texas.

By the end of the year, Tivoli plans to provide integration services that link NetView and other major network management platforms to the Tivoli Management Environment (TME) 10 systems management framework.

Then users who want to provide TME 10 services can coordinate them with their network manager of choice. Besides NetView, TME 10 will link with Cabletroo Systems, Inc.'s Spectrum, HP's OpenView and Sun's SunNet Manager.

The University of Florida has departments that run all of those network managers, "so this will really help us centrally run a TME 10 function like software distribution to make sure each network is ready to handle delivery," Wetherington said.

Similar integration services are coming in the next few months to link NetView for MVS to TME 10, Tivoli officials said. The goal is to help data center operators better track application performance through both SNA and client/server networks.

IBM had created some links between TCP/IP networks and NetView for MVS, "but we're not using those features now," said John Lewis, vice president in the technology services division at First National Bank of Maryland in Baltimore.

Instead, the bank built a manager of managers that can consolidate and filter all kinds of alerts, Lewis said, using Max/Enterprise from Maxm Systems Corp. in McLean, Va.

"The big mainframe sod NetView for AIX cash-cow customers have been left in the lurch while IBM absorbed Tivoli," Wilson said. "Now they are answering needs on that side on the way to building TME 10."

NetView for Windows NT *taps familiar interface functions provided by the server to ease training for new network managers*

Everything you're looking for in PCs.

From a place you probably didn't look.

You might not think of Unisys as a place to find state-of-the-art PCs for your company. But all that's changed with *Aquanta*™ PCs and servers. This new product line matches—and even surpasses—the best the PC world has to offer.

Aquanta means quality, with rigorous testing that ensures mainframe-class dependability for mission-critical applications.

Aquanta means performance, with one of the industry's most powerful end scalable product lines—including multiprocessor Pentium and Pentium Pro models, SMP servers and fault-resilient servers.

Aquanta means compatibility, with support for all major operating systems and networks to simplify client/server computing.

Aquanta means support, through Unisys worldwide experience implementing technology across departments, companies end countries.

And finally, *Aquanta* means this: While we may not be the first place you look for PCs, we just might be the last.

http://www.unisys.com/adv or 1-800-874-8647, ext. 244

© 1995 Unisys Corporation. Aquanta is a trademark of Unisys Corporation. The Intel Inside Logo, Pentium and Pentium Pro are registered trademarks of Intel Corporation.

UNISYS

The Information Management Company

Intel targets PC support costs

By April Jacobs
NEW YORK

Bracing for competition from network computing devices and hoping to grab some business in network management, Intel Corp. last week rolled out a strategy aimed at trimming corporate PC support and maintenance costs by 15% over the next year.

At its Wired For Management conference here, Intel executives said they can accomplish these cost savings by giving systems support staff better tools to diagnose and repair desktops remotely and by standardizing hardware and software components — such as Intel platforms running Windows NT.

"Initially, a lot of this stuff looks great, but I think I still have to see it to believe it," said Neal Abrams, information systems manager at New York-based Consentini Associates.

To arrive at the 15% cost-cutting goal, Intel used internal benchmarks from its IS migration plans and research, including a Gartner Group, Inc. study that shows PC ownership costs ranging from $9,000 to $12,000 annually.

In an unusual move at a vendor announcement, Intel trotted out its chief information officer, Louis Burns, to outline the company's plans to migrate its 50,000 users to Pentium-based hardware running Windows NT and Windows 95.

Burns said the PC is a safer bet for the enterprise than the network computer — generally described as a stripped-down device used primarily for accessing server-based applications and the Internet. "The network computer feels good, but it isn't flexible enough," he said.

Intel's strategy includes its LANDesk Support Center application for help desks and a series of Pentium Pro server platforms with built-in management hardware and software for remotely monitoring, diagnosing and repairing PC problems.

> "Initially, a lot of this stuff looks great, but I think I still have to see it to believe it."
>
> —*Neal Abrams, Consentini Associates*

The company already offers a hardware monitoring chip on Intel motherboards that tracks conditions such as temperature and voltage and reports them back to Intel's LANDesk Client Manager software.

Moving toward integration

Intel also has several efforts under way to integrate the LANDesk software with enterprise network management software such as Computer Associates International, Inc.'s Unicenter and Hewlett-Packard Co.'s OpenView.

Several users at the conference said because the strategy depends heavily on Intel's Pentium line, the predicted results may be unrealistic in the heterogeneous hardware environments at most companies.

For example, Paul Benziger, a vice president at BankAmerica International in New York, said his company has an array of hardware and software that would require a costly migration to bring it in line with Intel's strategy.

"What they have in mind is pretty good, but it will take most companies years to get there," he said. He added that even companies that have standardized on one vendor's hardware find themselves dealing with a mix of equipment when mergers and acquisitions take place.

Harry Tse, research director at The Yankee Group in Boston, said Intel's initiative to broaden its market is a natural progression, but the company will have to work to earn its place in areas such as network management software.

Baan's Amal Johnson on Informix.

"When Baan develops resource planning software, we try to anticipate the problems our customers may face tomorrow.

Partnering with Informix gives us the ability to create software that is extensible and configurable to any stage in a customer's business life cycle. Because we believe the faster you adapt to change, the faster you'll become an industry leader."

Amal Johnson
President, Baan Americas

"Informix isn't just about database software. We have the people, the technology, and the partners, like Baan, to make our customers successful today and in the future, no matter how unpredictable their business may be."

Tony DeCicco
Vice President of Professional Services, Informix

At Informix, we deliver innovative database technology for a growing number of industry leaders worldwide. By teaming with companies who share our vision, we provide our customers with the solutions they need to stay ahead of change, make the most of emerging opportunities, and gain a competitive edge in business.

INFORM

A Java pick-me-up for tired systems

Firms port language to boost aging platforms

By Frank Hayes

Can a shot of Java wake up legacy systems?

Digital Equipment Corp., Hewlett-Packard Co., IBM and Tandem Computers, Inc. are busy porting Sun Microsystems, Inc.'s Java Internet language to their proprietary mainframes and minicomputers, hoping to let users enliven their aging computing platforms.

Legacy systems

"We look at Java as a way of expanding what we can do with our VMS systems beyond the standard [capabilities]," said Joe Pollizzi, a senior engineering manager at the Space Telescope Science Institute in Baltimore. He also is president of the U.S. chapter of the Digital Equipment Computer Users Society.

Java is best known as a language for writing small programs that can be downloaded from the Internet and run inside a World Wide Web browser on a wide range of desktop computers.

And that is why it has piqued the interest of many developers, for now.

"Some of our college campuses are using a VMS-based system for registrar, bursar and financial work, and they're looking at adding Web interfaces. Adding Java certainly would be very beneficial for that," said Brian Cutler, a VMS systems manager at the State University of New York in Albany.

But Java also was designed to let the same program run on any Java-enabled computer without change. The ability to run Java may also provide legacy-system users with fresh software that wouldn't otherwise be available for their platforms. That would benefit applications and development tools that have nothing to do with the Internet.

Still, many users said they will wait and see before they let Java near their mission-critical applications.

"We're not using our HP 3000 for anything that would lead us toward using Java at this time," said Dan Buckland, HP systems project manager at Hickory Farms, Inc. in Maumee, Ohio. "I think it's a good development, but we're not going to use [Java] right now."

For some developers, Java has rushed onto the scene too quickly to be part of their agenda.

"We're in the throes of a giant development project to replace our mission-critical legacy systems, but this project started before the whole rave about Java, and Java is not part of it," said John Montgomery, director of technical services at Marine Terminals Corp. in San Francisco.

Eventually, Java seems likely to win over legacy users with its flexibility and portability — not to mention a little bit of trendiness. "This is a mature community that's not so much into flash," Pollizzi said. "But Java could bring a little more state-of-the-art and state-of-the-edge."

Symantec aims at enterprise developers with Java tool. See page 49.

Hitachi lures biggest iron users

By Michael Goldberg

Almost everyone in the mainframe world is talking about Parallel Sysplex, a clustering scheme that makes up to 32 System/390s look like one big computer.

But there's a difference between talking and doing.

Rather than jump to Parallel Sysplex immediately, several large mainframe shops this year chose Hitachi Data Systems Corp.'s Skyline servers, which use older, water-cooled technology and are the market's most powerful mainframes.

MIPS ships

Total processing capacity in MIPS shipped worldwide by IBM, Hitachi and Amdahl

Mainframe type	1995	1996*
Air-cooled	117,000	348,000
Water-cooled (Skyline excluded)	207,000	166,000
Skyline	0	75,000
Total shipments	**324,000**	**589,000**

*Projected

Source: International Data Corp., Framingham, Mass.

"We're evaluating Parallel Sysplex, and we've done a lot to be ready for it," said Joe Foster, vice president of planning at Cincinnati Bell Information Systems, Inc.'s (CBIS) data center in Orlando, Fla.

Wait and see

Foster said CBIS needs to update its DB2 database and other software to newer versions before moving to Parallel Sysplex, so the hardware change is "a few years" away.

"And we're sitting back and waiting to see what the rest of the world will do," Foster said.

So for now, CBIS installed a Skyline server to tackle its growing customer billing application.

Analysts predicted that most mainframe shops will use Parallel Sysplex technology within a couple of years — even if it's only to save money on their software licensing charges.

But observers said Skyline sales this year illustrate two points.

First, some information systems shops, such as CBIS, aren't ready for Parallel Sysplex. Second, the processing power of newer air-cooled mainframes based on CMOS processors hasn't hit the levels that are necessary at some large IS shops.

At 126 MIPS for a single-processor model, Skyline packs almost three times the computing capacity of the latest CMOS models from IBM and twice the engine power of the previous generation of water-cooled machines.

CMOS futures

Unlike Hitachi, rivals IBM and Amdahl Corp. are focusing their mainframe futures solely on CMOS machines.

Skyline's introduction "gave many of the larger companies a breathing space in getting to Parallel Sysplex," said David Floyer, a research director at International Data Corp. in Framingham, Mass.

Floyer projected that 1996 Skyline sales will be $1.2 billion for 75,000 MIPS in processing power.

That is about 8% of the total mainframe market (see chart).

Australia's labor department found that a five-processor Skyline server could run the entire Adabas database that handles job placement for the nation's unemployed, said Ross Caddy, assistant secretary for technical services at the Australian Department of Employment, Education, Training and Youth Affairs in Canberra.

'Don't ask, don't tell' becomes year 2000 avoidance policy

By Thomas Hoffman

Senior non-IS executives at most organizations are clueless about the potential impact of the year 2000 programming time bomb on their businesses.

That problem is compounded by the fact that many chief information officers and their year 2000 project managers are afraid to fill them in.

Those are key findings from a survey being released at the Society for Information Management's (SIM) Interchange '96 conference this week in San Francisco. The SIM Year 2000 Working Group Study was based on 207 responses from CIOs and year 2000 project managers across the U.S.

Many information systems managers "are either afraid or unwilling" to present the year 2000 problem to senior management "for fear of being blamed for it," said Leon A. Kappelman, associate professor of business computer information systems at the College of Business Administration at the University of North Texas in Denton.

Funding difficulties

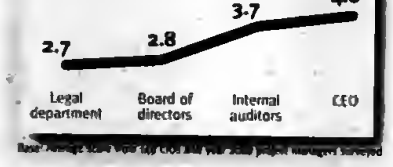
Kappelman, who headed the SIM study, said many IS managers "don't have a good explanation" for board-level executives as to what caused the year 2000 problem and the crippling effects it could have on a company's business. That communications gap makes it even more difficult for IS to get the necessary funding for conversion projects.

Some IS shops have landed funding for pilot projects and year 2000 impact assessment, but the money needed for large programming renovations "isn't on the radar screen. That means the message hasn't reached the top [management]," said Jim Jones, managing director of the Information Management Forum, an IS executive user group of Fortune 1,000 companies in Atlanta.

Perhaps that helps explain why only 10% of IS managers who participated in the survey said their organizations have a year 2000 project manager who spends more than 90% of his time tackling the project.

Ignorance is bliss

On a scale of 1 to 9, where 1 is being totally unaware of the year 2000 problem and 9 is being totally aware, rate the following groups based on your communications with each:



Source: Society for Information Management Year 2000 Working Group Study

One company that has successfully communicated that message is Equifax, Inc. in Atlanta. President and CEO Dan McGlaughlin heads the year 2000 task force at the information services firm. Equifax also has a year 2000 project manager — Laurie Nance — who has made recent presentations to the company's treasurer, chief financial officer and board of directors.

Nance advises other IS managers "to focus on the business issues instead of the technical issues" when attempting to draw senior management's attention to the year 2000 problem.

A Java pick-me-up for tired systems

Firms port language to boost aging platforms

By Frank Hayes

Can a shot of Java wake up legacy systems?

Digital Equipment Corp., Hewlett-Packard Co., IBM and Tandem Computers, Inc. are busy porting Sun Microsystems, Inc.'s Java Internet language to their proprietary mainframes and minicomputers, hoping to let users enliven their aging computing platforms.

Legacy systems

"We look at Java as a way of expanding what we can do with our VMS systems beyond the standard [capabilities]," said Joe Pollizzi, a senior engineering manager at the Space Telescope Science Institute in Baltimore. He also is president of the U.S. chapter of the Digital Equipment Computer Users Society.

Java is best known as a language for writing small programs that can be downloaded from the Internet and run inside a World Wide Web browser on a wide range of desktop computers.

And that is why it has piqued the interest of many developers, for now.

"Some of our college campuses are using a VMS-based system for registrar, bursar and financial work, and they're looking at adding Web interfaces. Adding Java certainly would be very beneficial for that," said Brian Cuttler, a VMS systems manager at the State University of New York in Albany.

But Java also was designed to let the same program run on any Java-enabled computer without change. The ability to run Java may also provide legacy-system users with fresh software that wouldn't otherwise be available for their platforms. That would benefit applications and development tools that have nothing to do with the Internet.

Still, many users said they will wait and see before they let Java near their mission-critical applications.

"We're not using our HP 3000 for anything that would lead us toward using Java at this time," said Dan Buckland, HP systems project manager at Hickory Farms, Inc. in Maumee, Ohio. "I think it's a good development, but we're not going to use [Java] right now."

For some developers, Java has rushed onto the scene too quickly to be part of their agenda.

"We're in the throes of a giant development project to replace our mission-critical legacy systems, but this project started before the whole rave about Java, and Java is not part of it," said John Montgomery, director of technical services at Marine Terminals Corp. in San Francisco.

Eventually, Java seems likely to win over legacy users with its flexibility and portability — not to mention a little bit of trendiness. "This is a mature community that's not so much into flash," Pollizzi said. "But Java could bring a little more state-of-the-art and state-of-the-edge."

Symantec aims at enterprise developers with Java tool. See page 49.

Hitachi lures biggest iron users

By Michael Goldberg

Almost everyone in the mainframe world is talking about Parallel Sysplex, a clustering scheme that makes up to 32 System/390s look like one big computer.

But there's a difference between talking and doing.

Rather than jump to Parallel Sysplex immediately, several large mainframe shops this year chose Hitachi Data Systems Corp.'s Skyline servers, which use older, water-cooled technology and are the market's most powerful mainframes.

MIPS ships

Mainframe type	1995	1996*
Air-cooled	117,000	348,000
Water-cooled (Skyline excluded)	207,000	166,000
Skyline	0	75,000
Total shipments	324,000	589,000

Source: International Data Corp., Framingham, Mass.

"We're evaluating Parallel Sysplex, and we've done a lot to be ready for it," said Joe Foster, vice president of planning at Cincinnati Bell Information Systems, Inc.'s (CBIS) data center in Orlando, Fla.

Wait and see

Foster said CBIS needs to update its DB2 database and other software to newer versions before moving to Parallel Sysplex, so the hardware change is "a few years" away.

"And we're sitting back and waiting to see what the rest of the world will do," Foster said.

So for now, CBIS installed a Skyline server to tackle its growing customer billing application.

Analysts predicted that most mainframe shops will use Parallel Sysplex technology within a couple of years — even if it's only to save money on their software licensing charges.

But observers said Skyline sales this year illustrate two points.

First, some information systems shops, such as CBIS, aren't ready for Parallel Sysplex. Second, the processing power of newer air-cooled mainframes based on CMOS processors hasn't hit the levels that are necessary at some large IS shops.

At 126 MIPS for a single-processor model, Skyline packs almost three times the computing capacity of the latest CMOS models from IBM and twice the engine power of the previous generation of water-cooled machines.

CMOS futures

Unlike Hitachi, rivals IBM and Amdahl Corp. are focusing their mainframe futures solely on CMOS machines.

Skyline's introduction "gave many of the larger companies a breathing space in getting to Parallel Sysplex," said David Floyer, a research director at International Data Corp. in Framingham, Mass.

Floyer projected that 1996 Skyline sales will be $1.2 billion for 75,000 MIPS in processing power.

That is about 8% of the total mainframe market (see chart).

Australia's labor department found that a five-processor Skyline server could run the entire Adabas database that handles job placement for the nation's unemployed, said Ross Caddy, assistant secretary for technical services at the Australian Department of Employment, Education, Training and Youth Affairs in Canberra.

'Don't ask, don't tell' becomes year 2000 avoidance policy

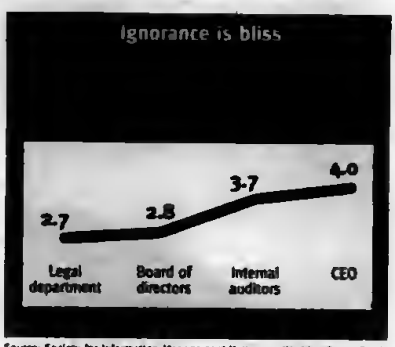
By Thomas Hoffman

Senior non-IS executives at most organizations are clueless about the potential impact of the year 2000 programming time bomb on their businesses.

That problem is compounded by the fact that many chief information officers and their year 2000 project managers are afraid to fill them in.

Those are key findings from a survey being released at the Society for Information Management's (SIM) Interchange '96 conference this week in San Francisco. The SIM Year 2000 Working Group Study was based on 207 responses from CIOs and year 2000 project managers across the U.S.

Many information systems managers "are either afraid or unwilling" to present the year 2000 problem to senior management "for fear of being blamed for it," said Leon A. Kappelman, associate professor of business computer information systems at the College of Business Administration at the University of North Texas in Denton.



Source: Society for Information Management Year 2000 Working Group Study

Funding difficulties

Kappelman, who headed the SIM study, said many IS managers "don't have a good explanation" for board-level executives as to what caused the year 2000 problem and the crippling effects it could have on a company's business. That communications gap makes it even more difficult for IS to get the necessary funding for conversion projects.

Some IS shops have landed funding for pilot projects and year 2000 impact assessment, but the money needed for large programming renovations "isn't on the radar screen. That means the message hasn't reached the top [management]," said Jim Jones, managing director of the Information Management Forum, an IS executive user group of Fortune 1,000 companies in Atlanta.

Perhaps that helps explain why only 10% of IS managers who participated in the survey said their organizations have a year 2000 project manager who spends more than 90% of his time tackling the project.

One company that has successfully communicated that message is Equifax, Inc. in Atlanta. President and CEO Dan McGlaughlin heads the year 2000 task force at the information services firm. Equifax also has a year 2000 project manager — Lauris Nance — who has made recent presentations to the company's treasurer, chief financial officer and board of directors.

Nance advises other IS managers "to focus on the business issues instead of the technical issues" when attempting to draw senior management's attention to the year 2000 problem.

©1996 Hewlett-Packard Company PE12595

We'd like to convince you to buy our new HP LaserJet 5 printer, but research says we don't have to.

Research could be wrong. For more information on our new HP LaserJet 5 printers, see your local dealer, call 1-800-LASERJET, Ext. 1473, or visit us on the Web at http://www.hp.com/info/1507.

HEWLETT® PACKARD

Bells lag on service

Improvements needed for RBOCs to compete in long-distance

By Kim Girard
and Thomas Hoffman

The choices are as clear as they are grim for the Baby Bells these days.

The regional Bell operating companies (RBOC) can either revamp their customer-support systems to keep their top business clients or lose ground in a free-for-all market where long-distance telephone companies are poised to snatch their customers.

Telecom systems

Federal regulators brought the nagging service issue to the forefront recently when they suggested they may delay the Nynex Corp./Bell Atlantic Corp. merger unless Nynex significantly improves its flagging levels of customer service. The $20 billion deal, if approved, would result in a telecommunications power across the Northeast and most of the Atlantic seaboard.

Long-term rivalry

Unlike the regional phone companies, AT&T Corp. and MCI Communications Corp. have worked in a fiercely competitive environment for years. That rivalry drove the long-distance providers to invest in sophisticated systems that link call centers to historical customer information.

This information, which is used heavily in marketing efforts, includes billing, services delivered and customer preferences. The long-distance giants will use that data as they set out to capture part of the $89.5 billion regional market.

Because they use less-sophisticated computer systems to service customers, the Baby Bells are bound to encounter problems sparring with long-distance providers, said Jeffrey Kagan, president of Kagan Telecom Associates, a market research firm in Atlanta.

Bell Atlantic has a clean service record with federal regulators and is widely considered the best RBOC for service, but Nynex has been fined $19 million so far this year.

Service penalties are slapped on companies that fail to meet a set of state-monitored performance standards.

The standards include items such as how long it takes the company to answer a customer call, how quickly the company responds and how long it takes to fix a problem, for example.

Andrew Stratford, a vice president at Congress Financial Corp. in New York, said his service with Nynex is "atrocious." He detailed a list of problems getting three trunk lines fixed on his network recently.

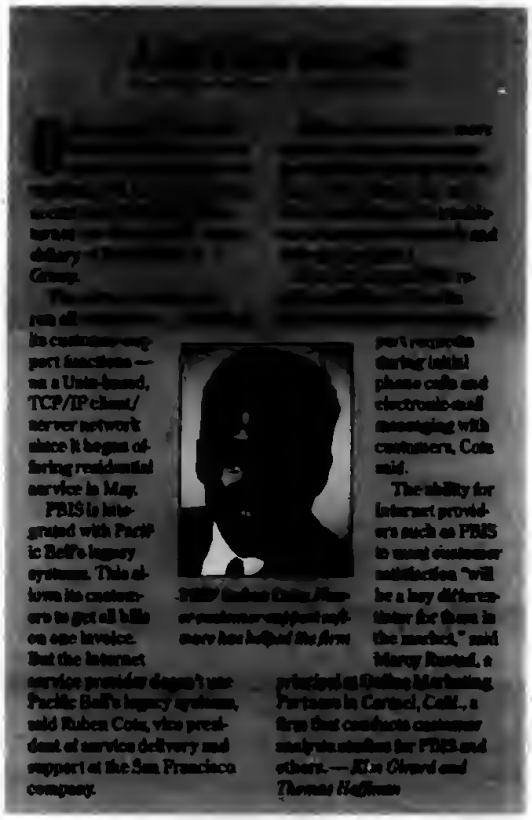
"I was screaming bloody murder," he recalled. "They finally checked routing and programming and found one of the trunks was configured wrong. Someone went into the switch and messed it up."

Nynex improvements

Nynex is making several enhancements to its customer information systems. The enhancements include a rollout of enhanced voice-response systems from Voicetek Corp. in Chelmsford, Mass., and IBM. The systems were designed to electronically answer customer billing questions and other inquiries.

Since Nynex began to upgrade the systems in June, its electronic inquiry completion rate has jumped from about 20% to 40%, said Kevin Hogan, managing director of customer information systems at Nynex in New York.

Nynex also is overhauling the customer information system used by its service agents. A Nynex agent previously needed to access up to five legacy applications to get an order processed, Hogan said. New software allows one of Nynex's 6,000 agents to handle the order on one screen, he said.



its customer-support functions — on a Unix-based, TCP/IP client/server network since it began offering residential service in May.

PBIS is integrated with Pacific Bell's legacy systems. This allows its customers to get all bills on one invoice. But the Internet service provider doesn't use Pacific Bell's legacy systems, said Ruben Cota, vice president of service delivery and support at the San Francisco company.

PBIS' Ruben Cota: Customer-support software has helped the firm

part responsible during initial phone calls and electronic-mail messaging with customers, Cota said.

The ability for Internet providers such as PBIS to meet customer satisfaction "will be a key differentiator for them in the market," said Margy Rastad, a principal at Online Marketing Partners in Carmel, Calif., a firm that conducts customer analysis studies for PBIS and others. — *Kim Girard and Thomas Hoffman*

NT database tools start to trickle in

By Craig Stedman

One of the big gaps in the Windows NT story — a lack of tools for managing multiple NT databases — is slowly starting to fill in.

BMC Software, Inc. and Platinum Technology, Inc. last week each laid out plans to target their cross-platform database management tools at Windows NT-based databases. That will give users an alternative to the more limited tools offered by individual database vendors and possibly reduce the need for labor-intensive, manual database administration.

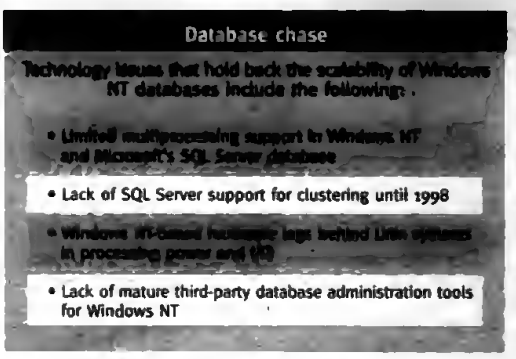
For example, The North West Co., a retailer with 170 stores in northern Canada and Alaska, uses BMC's database monitoring and change-management tools on several Unix-based Oracle Corp. databases and is looking at installing Microsoft Corp.'s SQL Server for Windows NT.

Changes that used to take one to two hours via manual navigation and scripting can now be done "in a matter of minutes," said Fred Unger, the retailer's advisory database administrator in Winnipeg, Manitoba. The manual process also left "a lot more room for error," he said.

Using the automated tools frees up time for more productive tasks such as developing databases and stored procedures, Unger said. It also speeds up the process of changing a database as business needs change, he said. "I'm not necessarily a bottleneck now."

NT vs. Unix

Analysts said a lack of sophisticated data management tools is one of the key factors that must be addressed before Windows NT can compete head-on with Unix as a corporate computing platform (see chart).



Source: Gartner Group, Inc., Stamford, Conn.

"Without those kinds of tools, it becomes hard to treat [Windows NT] as an important business resource, particularly if you have multiple databases," said Dan Kusnetzky, an analyst at International Data Corp. in Framingham, Mass.

Database vendors offer their own tools, but mastering multiple products "isn't a really good use of time," Kusnetzky said.

The database vendors' tools often have relatively meager capabilities, users and analysts added. The North West Co. looked at Oracle's data management tools, but they were limited to performance monitoring functions that didn't fully meet its needs, Unger said.

Houston-based BMC said both Windows NT and Unix databases will be supported by a new set of client/server data management tools within its Patrol product line, which previously was a systems management offering. Some tools are available now for NT-based Oracle and Sybase, Inc. databases. Support for Microsoft SQL Server is due in December.

Platinum Technology in Oakbrook Terrace, Ill., announced plans to add Windows NT support to a dozen of its data management tools. Some of these products are available on specific databases, such as Oracle. All major databases should be supported by the end of next year, Platinum officials said.

SGI defends low end against NT

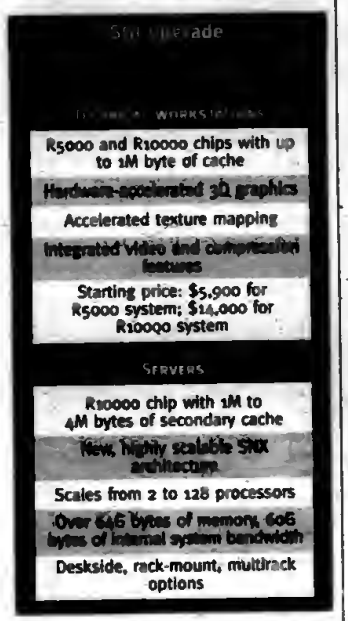
CONTINUED FROM PAGE 1

SGI last week said it will replace chip boards in an estimated 4,000 systems due to a flaw in the 64-bit R10000 RISC chip that will power most of the new systems.

The problem, which will cost SGI about $10 million to fix, is the result of a manufacturing process error that causes some chips to draw too much power, an SGI spokesman said. The chips were manufactured by NEC Corp. in Japan.

"I am really concerned about this. SGI charges premium prices for their products; they should have premium quality," said Madis Pihlak, associate professor and coordinator of the Landscape Architecture Program at the University of Maryland. A $500,000 SGI server at the university is among those affected by the flaw. But Pihlak welcomed the new products. "We have a terrific need for this kind of power," especially if it is aggressively priced, he said.

SGI's announcements are part of a trend among Unix vendors to significantly raise



the performance bar in the face of a growing Windows NT threat. SGI's new workstations, for instance, are expected to offer pace-setting graphics capabilities for almost the same price as Intel Corp. Pentium Pro-based Windows NT boxes.

The new SGI systems — some of which have starting prices of less than $6,000 — are expected to replace the company's entry-level Indy workstations.

Upping the ante

"SGI is significantly upping the ante in the [entry-level] 3-D and visualization space" with this announcement, said an analyst briefed on the products.

"They have to reinforce the low end with systems offering credible price-performance, or Intel wins the market in a walkaway," said James Greene, an analyst at Summit Strategies, Inc. in Boston.

At these kind of prices "we would be interested," said David Pensak, principal consultant for advanced computing technology at Du Pont Co. in Wilmington, Del. "There are a lot of areas where we would like to deploy workstations widely, but price has been a factor" against this, he said.

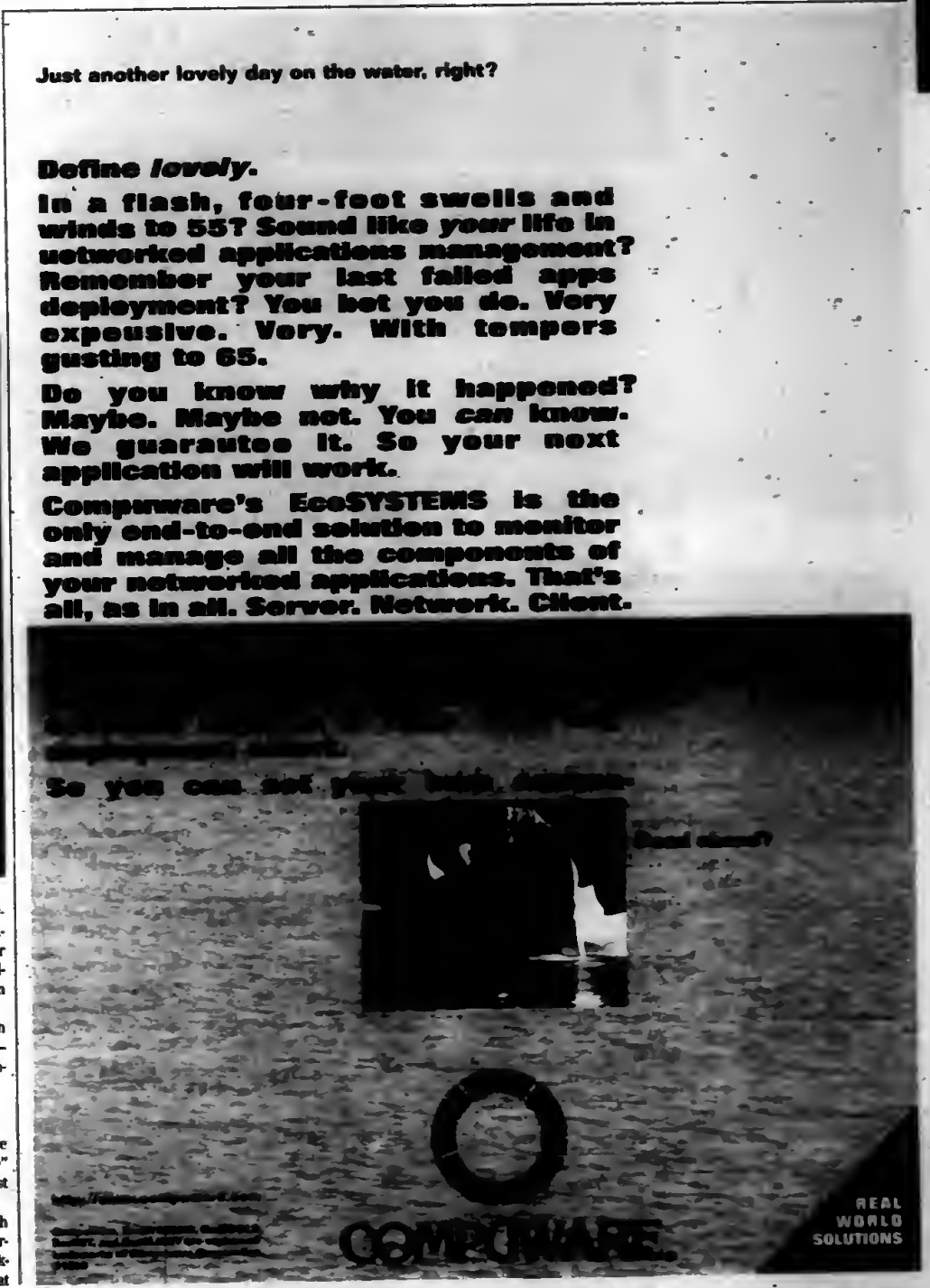
One of his concerns, however, was that the low cost could also mean lower functionality. "It depends on what kind of tradeoffs they had to make," he said.

The new servers will offer a range of new SMP options that are expected to integrate technology from SGI's recent acquisition of Cray Computer Corp.

The deskside, rack-mount and multirack systems range are based on R10000 chips. The chips have between 1M and 4M bytes of secondary cache and will come in several user-definable options including dual-processor systems and a 128-way server.

The SGI systems are based on the R10000 and R5000 chips and will support the upcoming Irix Release 6.3, SGI's latest Unix version.

The systems feature hardware-accelerated, three-dimensional graphics and texture mapping and a host of integrated video and compression features.



Blind users stymied by 'net graphics

CONTINUED FROM PAGE 1

user interfaces such as Web browsers.

Some access products are coming on the market, but progress is slow. "If you are working with anything other than a DOS-based platform, it can just be incredibly difficult to use the Web," Martin said.

According to the American Foundation for the Blind in Chicago, there are about 900,000 blind or visually impaired people who use computers.

"Things have never been better, and they have never been worse, for blind users," said Dan Wakefield, who is blind and a computer specialist at the General Services Administration in Washington. "The [Internet] was a lifesaver for blind users and workers, but the Web is becoming so graphical. And everything is mouse-driven — another problem for blind users who need keyboards."

Dan Oliver, who is blind and the director of information systems at the Massachusetts Commission on the Blind, called the GUI nature of the Web and intranets "one of our major concerns. The concern is that people may start to lose their jobs over this. Some already have."

Legal support

The Americans with Disabilities Act, passed in 1991, requires employers to make "reasonable accommodations" for employees with disabilities so that they can perform the "essential functions" of their jobs. But the act "doesn't have a lot of teeth," Wakefield said.

Still, experts said IS managers could help visually impaired users — and perhaps shield their companies from lawsuits — by allowing some employees to stay on DOS-based systems and selecting software that has built-in access features.

The real problem, said Larry Scadden, who is blind and a leading authority on assistant technology at the National Science Foundation in Arlington, Va., "is that technology is just not yet there in many cases. That's not IS' fault."

Getting better

Some technology fixes are coming. Microsoft Corp. has released an Active Accessibility software developer's kit for Windows applications.

And the latest version of Microsoft's Internet Explorer has a text-only option for screen readers.

This week, Netscape Communications Corp. is announcing a version of its Navigator browser that runs on IBM's OS/2 Warp 4. Warp 4 has speech-recognition capabilities that will aid visually impaired users, Netscape said.

Another promising technology is PWWebSpeak 1.2 from Productivity Works, Inc. in Trenton, N.J. It is a speaking Web browser designed to understand Hypertext Markup Language pages.

And Nynex Information Resources Co. has a text-based version of its Web directory, called Big Yellow (www.bigyellow.com), that works with screen readers.

Judith Dixon, consumer relations officer at Washington-based National Libraries Service for the Blind and Physically Handicapped, is a blind user of Big Yellow.

"Things are getting better all the time. Computers can do so much for the handicapped. We just need more help," she said.

Client/server vendors target vertical markets

By Tim Ouellette

Enterprise client/server vendors are tailoring their packages to specific markets rather than offering a general set of features to all users.

Market leaders such as SAP AG, Oracle Corp., Dun & Bradstreet Software and Baan Co. all made moves last week — or plan this week — to improve their standing in certain vertical markets.

Quicker to install

As a result, users are getting packages focused on their particular market instead of a blank slate to customize.

"We're very interested in that," said Andy Hafer, technology chief at Hydro Agri North America in Tampa, Fla., a SAP R/3 shop for the past two years.

Enterprise client/server products can be good medicine for shops that suffer under aging and unreliable mainframe systems. But their broad feature set and approach lead to a long planning, installation and customization process that could be a hard pill to swallow.

With targeted packages (see chart), users get faster ramp-up time and can rely on more consistent service from the vendor, who isn't supporting many different user shops that run a patchwork quilt of internally customized systems. But the new packages and deals, which include menus, modules and reports customized to the needs of specific markets, will help new users more than they will users who are already up and running.

"I wish what they are doing right now they were doing four years ago" when we started, Hafer said.

Vertical market strategies are now a necessity because vendors in this nearly $6 billion market have pretty much saturated all prospects for the sale of generic cross-industry products, said Tom Gormley, a senior analyst at Forrester Research, Inc. in Cambridge, Mass.

Diving into vertical markets

According to International Data Corp., financial services firms are more inclined to buy a mix of best-of-breed applications, but vendors consider the following markets ripe for fully customized client/server packages:

- RETAIL
- AEROSPACE
- PETROLEUM
- CHEMICALS
- PHARMACEUTICALS
- AUTOMOTIVE

Added value

But observers said they don't think this focus on vertical markets will hurt third-party integrators and consultants.

"We can add more bang for the buck by giving users things that really add value instead of chasing down minor integration problems all the time," said Andy Brauen, accounts executive at Oracle reseller Aris Corp. in Seattle. Specific vendor plans include the following:

- SAP this week will announce complete supply-chain planning software to the oil and gas industry and plans to announce versions of its R/3 system for telecommunications firms and utilities by year's end.
- Oracle will begin to focus on the chemical, energy and consumer packaged-goods markets, thanks to last week's purchase of manufacturing software developer Datalogix International.
- Electronic Data Systems Corp. agreed last week to resell D&B Software's SmartStream into various vertical markets.
- In a deal signed last week, Baan will create component-based client/server applications based on Sun Microsystems, Inc.'s Java.

Visual Basic

CONTINUED FROM PAGE 1

guage. This will do that for them," he said.

Enhancements to Visual Basic 5 include the following:

- The capability to build active documents, which means that an application can sit on the server and be called up on the client or through a browser. It also will take existing client applications and move them to the Internet. Excel has had the active document format in Windows 95, but developers haven't been able to build their own active documents.
- A change in the Visual Basic for Applications (VBA) language engine, which is finally going visual. VBA offers scripting capability inside the Excel spreadsheet program — just script, no components. As part of Visual Basic 5, it will be a full development environment with visual capabilities and automatic prompts that will drop in chunks of code for the developer.
- Closer ties with ActiveX that give the programming environment more cross-platform capabilities.

Application development

Details of the enhancements and additions have been closely guarded. Microsoft made everyone who attended the first keynote at the conference sign a nondisclosure agreement, and the first official announcements are expected this week.

Developers were especially interested in Microsoft's plans for its "active server," which is software that sits on the Internet server and dynamically creates Web pages in response to queries.

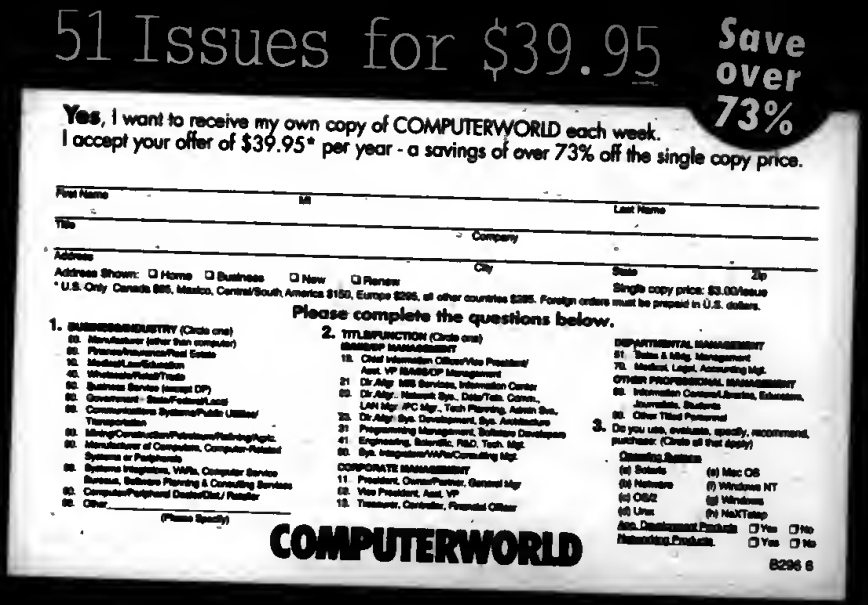
The active server — which has no release date yet but will work with Visual Basic 5 — builds original pages for every response, complete with dynamic links and drill-down capabilities. That contrasts with a normal response that feeds information into a prebuilt, static page.

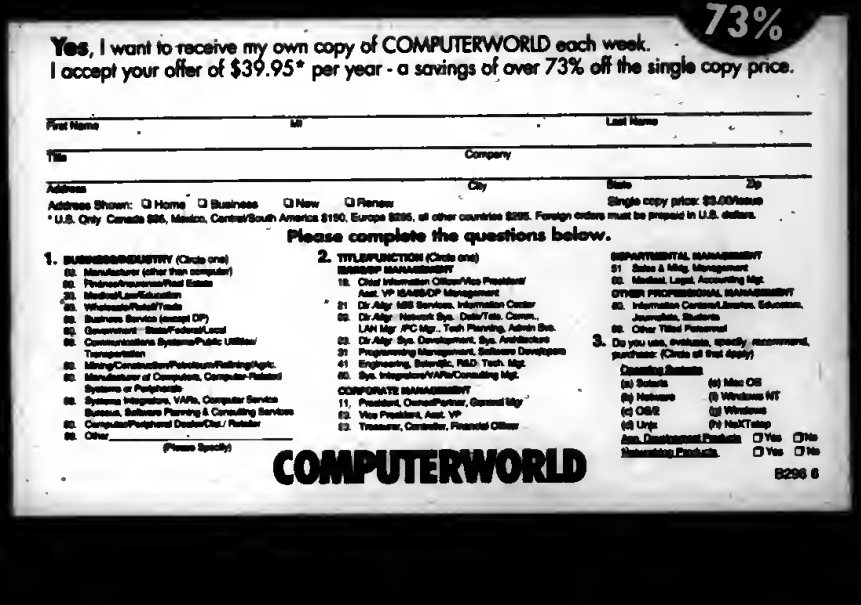
Visual Basic is a visual development tool with an estimated 1.5 million to 3 million users worldwide. Analysts and users said Java, Sun's Internet programming language, is fast becoming a contender for the interests of Visual Basic developers who want to develop on the Web.

"I have very many programs that would benefit from the Internet, and we're definitely heading in that direction. But I would like to stay with VB and not have to learn a new language," said Omar Nimer, a project leader for information systems at Hoosier Energy Rural Electric Corp., a utility in Bloomington, Ind. Nimer, who was one of the developers prebriefed at the conference, said last week's announcements made him hopeful that he won't have to switch.

Analysts said other vendors are offering many of the same capabilities that Visual Basic 5 will offer. But the Visual Basic enhancements will cause a stir because so many developers have been biding their time before jumping in to Internet applications.

"A big part of my job is updating multiple computers, thousands of computers," said Tim Elliott, a senior business consultant at Kraft Foods, Inc. in Glenview, Ill. "If I can take my VB applications and move them to our intranet so people can access them there, then that's for me. It's all about the Internet."


51 Issues for $39.95
Save over 73%
Yes, I want to receive my own copy of COMPUTERWORLD each week.
I accept your offer of $39.95* per year - a savings of over 73% off the single copy price.
First Name
MI
Last Name
Title
Company
Address
City
State
Zip
Address Shown: Home Business New Renew
Single copy price: $3.00/issue
* U.S. Only Canada $95, Mexico, Central/South America $150, Europe $295, all other countries $295. Foreign orders must be prepaid in U.S. dollars.
Please complete the questions below.
1. BUSINESS/INDUSTRY (Circle one)
00. Manufacturer (other than computer)
01. Finance/Insurance/Real Estate
10. Medical/Law/Education
40. Wholesale/Retail/Trade
50. Business Service (except DP)
60. Government - State/Federal/Local
70. Communications Systems/Public Utilities/ Transportation
80. Mining/Construction/Petroleum/Farming/Agric.
90. Manufacturer of Computers, Computer-Related Systems or Peripherals
99. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
92. Computer/Peripheral Dealer/Dist./ Retailer
99. Other
(Please Specify)
2. TITLE/FUNCTION (Circle one)
IS/MIS/DP MANAGEMENT
10. Chief Information Officer/Vice President/ Asst. VP IS/MIS/DP Management
21 Dir./Mgr. MIS Services, Information Center
03. Dir./Mgr.: Network Sys., Data/Tele. Comm., LAN Mgr. /PC Mgr., Tech Planning, Admin Svs.
23. Dir./Mgr. Sys. Development, Sys. Architecture
31 Programming Management, Software Developers
41 Engineering, Scientific, R&D, Tech. Mgr.
99. Sys. Integrators/VARs/Consulting Mgt.
CORPORATE MANAGEMENT
11 President, Owner/Partner, General Mgr
03. Vice President, Asst. VP
13. Treasurer, Controller, Financial Officer
DEPARTMENTAL MANAGEMENT
51 Sales & Mktg. Management
70. Medical, Legal, Accounting Mgt.
OTHER PROFESSIONAL MANAGEMENT
00. Information Centers/Libraries, Education, Journalists, Students
99. Other Titled Personnel
3. Do you use, evaluate, specify, recommend, purchase: (Circle all that Apply)
Operating Systems
(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep
App. Development Products Yes No
Networking Products Yes No
COMPUTERWORLD
B296 6


51 Issues for $39.95
Save over 73%
Yes, I want to receive my own copy of COMPUTERWORLD each week.
I accept your offer of $39.95* per year - a savings of over 73% off the single copy price.
First Name
MI
Last Name
Title
Company
Address
City
State
Zip
Address Shown: Home Business New Renew
Single copy price: $3.00/issue
* U.S. Only Canada $95, Mexico, Central/South America $150, Europe $295, all other countries $295. Foreign orders must be prepaid in U.S. dollars.
Please complete the questions below.
1. BUSINESS/INDUSTRY (Circle one)
00. Manufacturer (other than computer)
01. Finance/Insurance/Real Estate
10. Medical/Law/Education
40. Wholesale/Retail/Trade
50. Business Service (except DP)
60. Government - State/Federal/Local
70. Communications Systems/Public Utilities/ Transportation
80. Mining/Construction/Petroleum/Farming/Agric.
90. Manufacturer of Computers, Computer-Related Systems or Peripherals
99. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
92. Computer/Peripheral Dealer/Dist./ Retailer
99. Other
(Please Specify)
2. TITLE/FUNCTION (Circle one)
IS/MIS/DP MANAGEMENT
10. Chief Information Officer/Vice President/ Asst. VP IS/MIS/DP Management
21 Dir./Mgr. MIS Services, Information Center
03. Dir./Mgr.: Network Sys., Data/Tele. Comm., LAN Mgr. /PC Mgr., Tech Planning, Admin Svs.
23. Dir./Mgr. Sys. Development, Sys. Architecture
31 Programming Management, Software Developers
41 Engineering, Scientific, R&D, Tech. Mgr.
99. Sys. Integrators/VARs/Consulting Mgt.
CORPORATE MANAGEMENT
11 President, Owner/Partner, General Mgr
03. Vice President, Asst. VP
13. Treasurer, Controller, Financial Officer
DEPARTMENTAL MANAGEMENT
51 Sales & Mktg. Management
70. Medical, Legal, Accounting Mgt.
OTHER PROFESSIONAL MANAGEMENT
00. Information Centers/Libraries, Education, Journalists, Students
99. Other Titled Personnel
3. Do you use, evaluate, specify, recommend, purchase: (Circle all that Apply)
Operating Systems
(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep
App. Development Products Yes No
Networking Products Yes No
COMPUTERWORLD
B296 6

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 55B MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

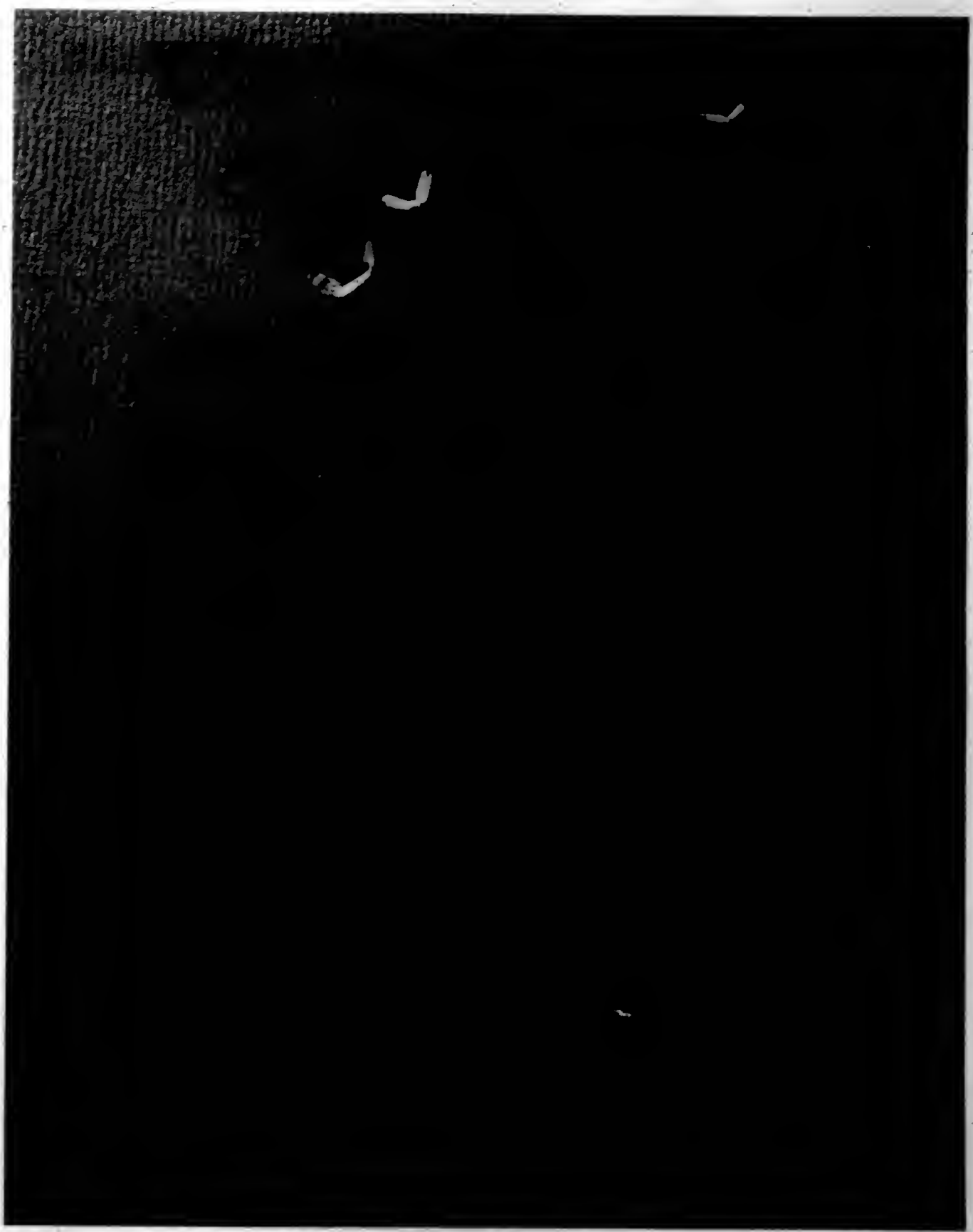
COMPUTERWORLD
P O BOX 2044
MARION OHIO 43306-2144

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 55B MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD
P O BOX 2044
MARION OHIO 43306-2144



configure 1

- Full-Function Notebook
- Lithium Ion Battery
- Internal Diskette Drive

configure 2

- Multimedia
- CD-ROM
- 3 Lithium Ion Batteries
- 16-Bit Stereo Sound
- Duel Speakers
- NTSC/PAL TV Output

Detachable lithium ion battery also functions as a handle and a keyboard tilt.

Choice of SVGA displays from 11.3" CSTN to 11.8" CTFT.

Up to 133 MHz Pentium® processor, hard drives up to 1 GB.

Dual speakers integrated in the CD base provide 16-bit stereo sound.

This base is detachable and houses the CD-ROM.

THE COMPAQ ARMADA 4100. IF IT'S

It's your call. On one hand, it's a full-function notebook. Or in a snap it's multimedia with CD-ROM. Or it's lean and mean. It also fax machines* and dual speakers for incredible 16-bit stereo sound. And it's Internet-ready. The new Compaq Armada 4100. It's how to

intel inside pentium processor

©1996 Compaq Computer Corporation. All rights reserved. Compaq registered U.S. Patent and Trademark Office. SpeedPaq and Armada are trademarks of Compaq Computer Corporation. *Speakerphone and answering machine require Compaq SpeedPaq 288 Telephony Modem, available in Summer 1996. Fax machine requires modem. The Intel Inside Logo and Pentium are registered trademarks and the Pentium Processor Logo is a trademark of the Intel Corporation. Other products mentioned may be trademarks of their respective companies.

configure 3

Slimline

5.1 Lbs.

1.5" Thick

configure 4

Rest

Relaxetion

Peace of Mind

Memory expandable up to 48 MB.

Touchpad can be replaced by an optional trackball.

Internal diskette drive is replaced by a battery.

NOT ONE THING, IT'S ANOTHER.

provides for three batteries with up to 10 hours of life. It's a virtual office too–complete with a full duplex speakerphone, answering and conquer the task at hand. One way or another. For more information, call 1-800-853-9521. Or visit our site at www.compaq.com.

COMPAQ

Has It Changed Your Life Yet?

Migration aggravation for some Notes users

By Tim Ouellette

Some users of Lotus Development Corp.'s Message Transfer Agents (MTAs) for Notes aren't getting the message the way they should.

The MTAs, which let Notes servers natively exchange messages with other electronic-mail environments — including the Internet — have been plagued by several bugs that can crash servers or limit the flow of ingoing or outgoing messages.

For example, users said the Simple Mail Transfer Protocol (SMTP) MTA froze Windows NT Notes servers when a user replied to an Internet E-mail message and included the text from the original message in the reply. This happened most often when users installed an interim Notes server upgrade, Notes 4.11a.

Lotus officials said there was a bug in some of the internationalization code in that version. The company posted a workaround at its World Wide Web site (www.lotus.com). Lotus said the glitch will be corrected in the next version of the MTA.

"[The MTA for Windows NT] is obviously a bit rushed and doesn't inspire me with confidence that it will be plain sailing," said Peter Court, a consulting systems engineer at Ferntree Computer Corp. in Australia, a subsidiary of GE Capital Services Co. Ferntree plans to install the NT version of the SMTP MTA within a week.

Moving day

Lotus	CC:Mail (shipping)
Microsoft	Mail
IBM	OfficeVision
Digital	All-in-1
Verimation	Memo
H&W Computer Systems	SYSM
Fischer International Systems	EMC2/TAO

Connecting to the Internet from traditionally proprietary systems such as Notes isn't always easy, especially when they are mixed with numerous updates to the main products.

Microsoft Corp. had similar problems this summer with its Exchange Internet Mail Connector, which failed when users began running a new version of the Windows NT Server operating system [CW, June 30].

The only concern with Lotus' MTA for CC:Mail users was its limited documentation, though a few users experienced problems with Notes accepting attachments from CC:Mail.

"I spent over three weeks trying to configure the MTAs, due to the very vague instructions and the inaccessibility of Lotus support," said Deb Penny, a Notes consultant working at a 6,000-seat Notes shop.

"But once installed, the CC:Mail is flawless and runs smoothly," Penny said.

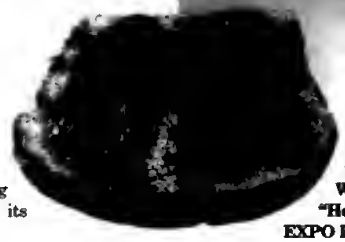
Besides addressing these issues, Lotus in Cambridge, Mass., last week announced migration tools to help more users move quickly from their legacy E-mail systems to Notes (see chart). The migration tools convert messages, attachments, folders and directories from the legacy system to Notes format without losing data.

Lotus also promised to deliver a generic Notes Migration Toolkit that lets users create their own migration tools to move to Notes from any other E-mail system. The tool kit is expected by early next year.

A new retail product filters junk E-mail. See page 55.

Wednesday, Oct. 9th at UNIX EXPO

Can you
peanut butter vs. jelly?



A lot of pairings are special because the results demonstrate synergy — the whole being greater than the sum of its parts.

Lake Torville and Dean... Siskel and Ebert... The Internet and the World Wide Web.

And UNIX System and Microsoft Windows NT technologies.

Despite reports of an "OS War," many users and vendors are succeeding with both UNIX and Windows NT. The facts: each is great for certain tasks and environments, and the two together often spell synergy and greater success, for vendors, software developers and IS users and managers.

That's why AIM Technology, a division of Network General Corporation, the most respected provider of independent performance benchmarks, now offers test suites for both UNIX System and Windows NT implementations. **That's why AIM's giving out both Windows NT and UNIX "Hot Iron" Awards at UNIX EXPO Plus** on Oct. 9th, in New York.

And that's why *Computerworld*, "the newspaper of information systems management," is sponsoring these awards, which will be presented by Bill Gates of Microsoft for Windows NT and Alok Mohan of SCO for UNIX.

Because great technologies don't become truly great until they come together — like Windows NT and UNIX will at the show.

See us at booth #1836.

Experience the AIM Hot Iron award-winning systems for UNIX and Windows NT in AIM's booth, #1836, at UNIX EXPO Plus, or contact AIM Technology at 800-848-8649, Email: benchinfo@aim.com, or visit our Web site at http://www.aim.com.

AIM TECHNOLOGY
A NETWORK GENERAL COMPANY
www.aim.com

Accept Nothing Less
www.hi.com

COMPUTERWORLD
Everything you need to know.
www.computerworld.com

All companies or product names are trademarks or registered trademarks of their respective holders

Migration aggravation for some Notes users

By Tim Ouellette

Some users of Lotus Development Corp.'s Message Transfer Agents (MTAs) for Notes aren't getting the message the way they should.

The MTAs, which let Notes servers natively exchange messages with other electronic-mail environmeots — including the Internet — have been plagued by several bugs that can crash servers or limit the flow of ingoing or outgoing messages.

For example, users said the Simple Mail Transfer Protocol (SMTP) MTA froze Windows NT Notes servers when a user replied to an Internet E-mail message and included the text from the original message in the reply. This happened most often when users installed an interim Notes server upgrade, Notes 4.11a.

Lotus officials said there was a bug in some of the internationalization code in that version. The company posted a workaround at its World Wide Web site (www.lotus.com). Lotus said the glitch will be corrected in the next version of the MTA.

"[The MTA for Windows NT] is obviously a bit rushed and doesn't inspire me with confidence that it will be plain sailing," said Peter Court, a consulting systems engineer at Ferntree Computer Corp. in Australia, a subsidiary of GE Capital Services Co. Ferntree plans to install the NT version of the SMTP MTA within a week.

Connecting to the Internet from traditionally proprietary systems such as Notes isn't always easy, especially when they are mixed with numerous updates to the main products.

Microsoft Corp. had similar problems this summer with its Exchange Internet Mail Connector, which failed when users began running a new version of the Windows NT Server operating system [CW, June 30].

The only concern with Lotus' MTA for CC:Mail users was its limited documentation, though a few users experienced problems with Notes accepting attachments from CC:Mail.

"I spent over three weeks trying to configure the MTAs, due to the very vague instructions and the inaccessibility of Lotus support," said Deb Penny, a Notes consultant working at a 6,000-seat Notes shop.

"But once installed, the CC:Mail is flawless and runs smoothly," Penny said.

Besides addressing these issues, Lotus in Cambridge, Mass., last week announced migration tools to help more users move quickly from their legacy E-mail systems to Notes (see chart). The migration tools convert messages, attachments, folders and directories from the legacy system to Notes format without losing data.

Lotus also promised to deliver a generic Notes Migration Toolkit that lets users create their own migration tools to move to Notes from any other E-mail system. The tool kit is expected by early next year.

A new retail product filters junk E-mail. See page 55.

Wednesday, Oct. 9th at UNIX

Can you peanut butt

A lot of pairings are special because the results demonstrate synergy — the whole being greater than the sum of its parts.

UNIX System and Windows NT implementations. That's why AIM's giving out both Windows NT and UNIX "Hot Iron" Awards at UNIX EXPO Plus on Oct. 9th, in New York.

Like Torville and Dean... Siskel and Ebert... The Internet and the World Wide Web.

And UNIX System and Microsoft Windows NT technologies.

Despite reports of an "OS War," many users and vendors are succeeding with both UNIX and Windows NT. The facts: each is great for certain tasks and environments, and the two together often spell synergy and greater success, for vendors, software developers and IS users and managers.

That's why AIM Technology, a division of Network General Corporation, the most respected provider of independent performance benchmarks, now offers test suites for both

And that's why *Computerworld*, "the newspaper of information systems management," is spoosoring these awards, which will be preseoted hy Bill Gates of Microsoft for Windows NT and Alok Mohan of SCO for UNIX.

Because great techoologies don't become truly great until they come together — like Windows NT and UNIX will at the show.

See us at booth #1836.

Experience the AIM Hot Iron award-winning systems for UNIX and Windows NT in AIM's booth, #1836, at UNIX EXPO Plus, or contact AIM Techoology at 800-848-8649. Email: benchinfo@aim.com, or visit our Web site at http://www.aim.com.

AIM TECHNOLOGY
A NETWORK GENERAL COMPANY
www.aim.com

Accept Nothing Less
www.hk.com

COMPUTERWORLD
Everything you need to know.
www.computerworld.com

All companies or product names are trademarks or registered trademarks of their respective holders.

The button-down attitude was fine in the mainframe world, but now the computing world has rapidly expanded. With thousands of PCs and servers, today's IT environment demands more flexibility, and more rapid response, from you and your suppliers.

Call Vanstar, the distributed computing experts. We offer the life cycle services you need to manage your IT growth: consulting and design, network planning, integration, procurement, financing, installation, and deskside support.

With Vanstar, you choose as much, or as little, of our expertise as you need. That's why hundreds of Fortune 1000 companies have selected us to support their distributed computing environments.

Please visit us at **www.vanstar.com/nostarch** or call us at **1-800-994-2345** to learn more. You'll get the expertise and discipline you need, without the attitude.

VST
Listed
NYSE

©1996 Vanstar Corporation. All trademarks are the property of their respective owners.

Vanstar
THE TECHNOLOGY SERVICES COMPANY

Visit our web site: www.vanstar.com/nostarch

The beauty of our
Web-deployable software is that you can install
100 different sites in 5 minutes.

(But that'll be our little secret.)

It was only a

before someone did it.

architecture, we're first. LAWSON INSIGHT,™ our

can be up and running throughout your organization with one

Any authorized workstation with a Web browser can access the applications, without

LAWSON INSIGHT supports Activity-Based Management, delivering integrated, cross-functional solutions through

Visit us at
www.lawson.com/insight
or call
1-800-477-1357.

LAWSON™

© 1998 Lawson Software

matter of time

And thanks to our unique

new Web-deployable business management system,

installation—no matter how many sites or hardware platforms you have.

sacrificing functionality. And new sites can be added for the cost of the browser software. Plus,

financials, human resources, procurement and supply chain applications. LAWSON INSIGHT. *Because the future can't wait.*

Vendors back multicast technology

By Bob Wallace

A vendor association has formed to push a technology for supporting video, audio and multimedia applications over the Internet.

But users and analysts question whether the group's goals are ambitious enough.

The IP Multicast Initiative comprises 16 network hardware and software vendors and was formed to boost awareness of IP Multicast, a bandwidth-conserving technology for point-to-multipoint applications.

Today's one-to-one "unicast" technology creates parallel point-to-point links among the sender and all recipients. IP Multicast is a more efficient technology that sends a single "stream" of data that can be accessed by any recipient.

IP Multicast is best suited for multipoint videoconferencing, audio feed and multimedia applications.

The IP Multicast Initiative's council will meet Oct. 3 and will finalize a schedule of events for the next year, including industry conferences, educational seminars for users and vendors and marketing programs.

No one questions the benefits of IP Multicast, but many are skeptical of the initiative's agenda or don't see an immediate need for the technology.

> "I don't want to throw mud on the objective, which has merit, but I don't see the beef here."
>
> —*John Morency, The Registry*

"I don't want to throw mud on the objective, which has merit, but I don't see the beef here," said John Morency, a principal at The Registry, Inc., a consultancy in Newton, Mass.

"This group needs to deliver to the user something to justify its existence, but I see no mention of interoperability or performance testing, creation of specifications for IP Multicast or any standard plan to manage the technology," he said.

Interoperability testing

Morency said many of the initiative's 16 vendors have proprietary IP Multicast schemes and that interoperability testing would provide users value at the conferences and seminars that the initiative plans to hold.

A spokesman for the group said it has no plans to go beyond promoting user awareness of IP Multicast.

"There's really no overwhelming need for multimedia applications by the mainstream of users," said Bill Horst, chief at the General Services Administration's communications branch in Philadelphia.

IP Multicast Initiative members include 3Com Corp., Bay Networks, Inc., Cabletron Systems, Inc., Cisco Systems, Inc., Microsoft Corp. and Netscape Communications Corp.

Users need to gear up for a new version of IP. See page 55.

Circle K Stores
efficient market services
General Mills
H.E.B. Grocery Company
Hewlett-Packard Company
Longs Drug Stores
Pharmacy Data Management
Sara Lee Intimates
Seafirst Bankcard Services
THE GOOD GUYS!
Tufts Health Plan
SOFTBANK Services Group
Welborn Clinic

Picture Your Data On Red Brick.™

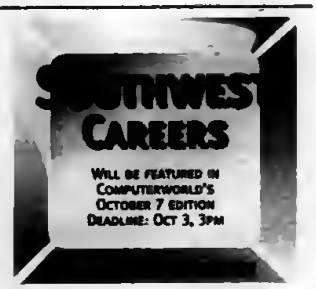
Nine West provides leading shoe and accessory fashions to discriminating buyers worldwide. Enormous amounts of design, manufacturing and business decisions go into making this famous footwear.

"We depend on knowing what types of shoes are selling in which areas in order to be successful," says Bob Forte, senior vice president of Information Systems at Nine West Group Inc. "We use Red Brick Warehouse to manage inventory and determine sales trends so we can better service our growing customer base."

Nine West relies on Red Brick.
Shouldn't you?

RED BRICK®
The Data Warehouse Company™

1 800 777 2585 • http://www.redbrick.com • Fax 1 408 399 3277



A database server that processes information the way you do. Really fast. All at once.

Digital 64-bit technology and Sybase SQL Server 11. Do more, sooner.

Meet the ultimate in efficiency: Digital's mammoth RAM capacity, optimized by the Sybase SQL Server 11™ Logical Memory Manager. Letting you run OLTP and decision support applications on the same server — with lightning-fast response times. So you maximize your hardware investment while boosting productivity, scalability and price/performance.

SYBASE® digital™

To learn more about this powerful competitive weapon, call 1•800•8•SYBASE, ext. 47893 or 1•800•DIGITAL, press 4, today.

www.sybase.com www.digital.com

PKW

©1996 Digital Equipment Corporation. Digital and the DIGITAL logo are trademarks of Digital Equipment Corporation. Sybase is a registered trademark of Sybase Inc. All other trademarks or registered trademarks are properties of their respective companies.

Announcing

bettersmarter

ways to

safely store all

the information

on the planet.

[redacted] Somehow, the smaller the world gets, the more its information grows. Each day, networked computers are making more kinds of information available to more people than ever before. From last night's sales figures to next year's economic forecasts, information is the lifeblood of business. And that makes managing and storing it even more vital.

At IBM, we're constantly thinking of new ways to maximize the value of information to your company. Part of which means understanding that different kinds of users can have different kinds of storage needs. For some, the reliability of a 24-hour, seven-day-a-week system is critical. For others, having fast access is key. And with rare exception, cost is always an important consideration.

With all this in mind, we're adding a series of new products to our proven RAMAC™ Array Family of storage systems.

If your focus is a low total cost of ownership, the RAMAC Virtual Array Model 2 is as economical as it is flexible. If growth is on your mind, the

IBM is a registered trademark and RAMAC and Solutions for a small planet are trademarks of IBM Corp. © 1996 IBM Corporation. All rights reserved.

fastercheaper

RAMAC Scalable Array lets you add both capacity and performance when your requirements change. Need more speed? The RAMAC Electronic Array gives users hyperfast access to stored data. And if your priority is simply the highest level of data availability, the new RAMAC 3 delivers it with twice the capacity and up to three times the speed of our earlier designs.

We're also making it easier to move into new technology. IBM® RAMAC Data Migrator is a service that transfers data from any 3990 or compatible subsystem to any other 3990 or compatible subsystem, with minimal downtime.

All this is backed with the IBM service and support you've come to expect.

Only better. Smarter. Faster. Cheaper.

To find out how you can get more out of storage, drop by www.storage.ibm.com today or call your IBM representative.

Solutions for a small planet™ IBM.

NT to go 64-bit with Intel

By Bob Francis

Microsoft Corp. plans to take Windows NT on a 64-bit road trip to Intel Corp.'s Merced processor, which is expected to come out in 1998, the two companies said recently.

The announcement means information systems managers can expect to see some 64-bit NT applications when the new chip is available. When the 32-bit Pentium Pro chip was released, Windows NT was available, but very few 32-bit applications were ready for the chip.

"Intel has been very successful in developing good low-cost processors, so we're certainly interested in seeing how this will work," said Michael G. Tardif, vice president of enterprise technology at Goldman, Sachs & Co.

Value in NetWare

Other IS managers weren't so sure they would need systems that powerful. "We still see a lot of value in the NetWare environment," said Diane Delvecchio, an IS consultant at Smith Environmental Services, Inc. in Dallas.

Potential uses for the 64-bit chip and operating system include large databases and high-speed graphics applications.

The Merced processor is Intel's next-generation 64-bit processor, which is part of the company's next generation of chips. Processors from Intel in Santa Clara, Calif., are currently 32-bit; they process instructions 32 bits at a time. The 64-bit chips will double that speed. Merced is expected to be available late next year, with general availability in 1998, sources said.

Intel is on track with the Merced processor, which it is co-developing with Hewlett-Packard Co., said Dean McCarron, an analyst at Mercury Research in Scottsdale, Ariz. "They've been very pleased with what they'd done so far, but there can always be slip-ups with new chips," he said.

But Microsoft is plunging ahead with the 64-bit version of Windows NT. The company will release a preliminary copy of the 64-bit Windows NT specification at an upcoming Professional Developers Conference, company officials said.

Compaq to take on workstations

PC vendor challenges Sun, IBM, HP

By Bob Francis

Working on workstations

Compaq plans to roll out the first products from its workstation division on Oct. 28. These systems will include:

PROCESSORS: 200-MHz Pentium Pro (single and dual)

MEMORY: 64M bytes minimum

STORAGE: 2G bytes minimum

GRAPHICS: ELSA's Gloria-M and Gloria-L graphics controllers

PRICE: Less than $8,000

Market-leading PC vendor Compaq Computer Corp. plans to launch its first workstation products Oct. 28.

The Houston company's new systems will be built around Intel Corp.'s Pentium Pro processor and are positioned against RISC-based workstations from vendors such as Sun Microsystems, Inc., IBM and Hewlett-Packard Co. IBM and HP recently introduced high-end Pentium Pro workstations for the same market.

Users are applauding Compaq's entry, but it may not be an easy sell.

"Compaq's going to have to prove themselves in this market," said Cheryl Currid, president of Currid & Co., a consulting group in Houston. "Users aren't going to buy unless they know they can get the service and support they get from current vendors."

Top dog

Being the market leader in PC sales does give Compaq some leverage. The company has lined up several leading graphics suppliers for the new machines, including Intergraph Computer Systems, Inc. in Huntsville, Ala., and ELSA, Inc. in Germany. "People will want to work with Compaq because of their size," Currid said.

According to sources familiar with Compaq's plans, the company will offer systems geared for computer-aided design and manufacturing, engineering and three-dimensional graphics applications. The company also plans additional service and support options.

And just as the company has done with SAP AG, Compaq will announce several partnerships with leading workstation software vendors such as Autodesk, Inc. and Mentor Graphics Corp.

Fore takes a swing at Gigabit Ethernet

By Bob Wallace

Fore Systems, Inc.'s announcement last week that it will support Gigabit Ethernet could have been a concession that the new technology is a serious threat to ATM — Fore's forte.

Switching

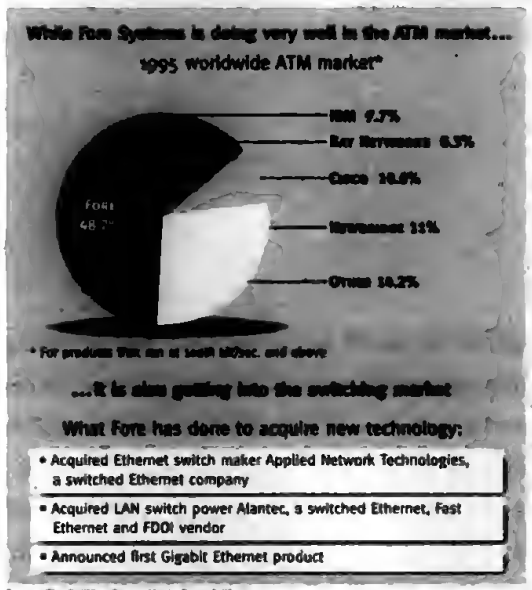
But instead of rolling out a comprehensive strategy to combine Gigabit Ethernet and Asynchronous Transfer Mode (ATM), Fore promised to ship a Gigabit Ethernet uplink for one of its many LAN switches in about a year.

Gigabit Ethernet, which lets Ethernet run at 1G bit/sec. rather than its current maximum of 100M bit/sec., has been hyped as a major competitor to ATM switching. Gigabit Ethernet products haven't shipped yet.

Fore is still betting on the success of ATM but is trying to make its products as attractive as possible by supporting a range of other switching options, analysts said.

But ATM users aren't overly excited about Gigabit Ethernet. "It's just another new technology that will take at least a few years to come to fruition," said Steve Fall, a systems scientist at Computer Sciences Corp. in Huntsville, Ala.

Fore officials said Gigabit Ethernet will probably do fine as an interface for non-time-critical, data-only traffic. But officials said users need ATM to mix voice, data and video on backbone networks. Fore has no plans for Gigabit Ethernet products beyond the promised uplink for its PowerHub 7000 switch, officials said.



Source: The Dell'Oro Group, Menlo Park, Calif.

Office 97 shipment delayed

Excel upgrade to include new collaboration features

By Lisa Picarille

Some users hoping to get an updated version of Microsoft Office under their Christmas trees will have to wait a little longer for their new software suite.

Microsoft Corp. last week announced that the retail shipping date for Office 97 is Jan. 23.

But the Redmond, Wash., software giant still plans to ship in December Office 97 Standard Edition and Professional Edition — along with FrontPage 97 and Team Manager — to its Select corporate customers.

Software suites

Dennis Tevlin, Microsoft's group product manager for Office, declined to give the exact number of Select customers but said "thousands of corporations" subscribe to the Select program. Those corporate users who aren't part of the Select program will have to wait until the end of January for Office 97.

Users looking for new versions of the stand-alone applications that Office 97 includes — Word 97, Excel 97 and Access 97 — will get them in February. The stand-alone versions of PowerPoint 97 and Outlook 97 are delayed until March.

The new version of Excel is expected to make it easier for users to access its features, including the following:

- Custom cells that give users more control over cell size and formatting, and the ability to rotate and size text.
- Shared Workbooks that allow multiple users to simultaneously edit a single workbook. Changes are tracked and logged.
- Web queries that let users bring in data from the Internet or an intranet. The imported information can be analyzed and manipulated.

NT to go 64-bit with Intel

By Bob Francis

Microsoft Corp. plans to take Windows NT on a 64-bit road trip to Intel Corp.'s Merced processor, which is expected to come out in 1998, the two companies said recently.

The announcement means information systems managers can expect to see some 64-bit NT applications when the oem chip is available. When the 32-bit Pentium Pro chip was released, Windows NT was available, but very few 32-bit applications were ready for the chip.

"Intel has been very successful in developing good low-cost processors, so we're certainly interested in seeing how this will work," said Michael G. Tardif, vice president of enterprise technology at Goldman, Sachs & Co.

Value in NetWare

Other IS managers weren't so sure they would need systems that powerful. "We still see a lot of value in the NetWare environment," said Diane Delvecchio, an IS consultant at Smith Environmental Services, Inc. in Dallas.

Potential uses for the 64-bit chip and operating system include large databases and high-speed graphics applications.

The Merced processor is Intel's next-generation 64-bit processor, which is part of the company's next generation of chips. Processors from Intel in Santa Clara, Calif., are currently 32-bit; they process instructions 32 bits at a time. The 64-bit chips will double that speed. Merced is expected to be available late next year, with general availability in 1998, sources said.

Intel is on track with the Merced processor, which it is co-developing with Hewlett-Packard Co., said Dean McCarron, an analyst at Mercury Research in Scottsdale, Ariz. "They've been very pleased with what they'd done so far, but there can always be slip-ups with new chips," he said.

But Microsoft is plunging ahead with the 64-bit version of Windows NT. The company will release a preliminary copy of the 64-bit Windows NT specification at an upcoming Professional Developers Conference, company officials said.

Compaq to take on workstations

PC vendor challenges Sun, IBM, HP

By Bob Francis

Market-leading PC vendor Compaq Computer Corp. plans to launch its first workstation products Oct. 28.

The Houston company's new systems will be built around Intel Corp.'s Peotium Pro processor and are positioned against RISC-based workstations from vendors such as Sun Microsystems, Inc., IBM and Hewlett-Packard Co. IBM and HP recently introduced high-end Pentium Pro workstations for the same market.

Working on workstations

PROCESSORS: 200-MHz Pentium Pro (single and dual)

MEMORY: 64M bytes minimum

STORAGE: 2G bytes minimum

GRAPHICS: ELSA's Gloria-M and Gloria-L graphics controllers

PRICE: Less than $8,000

Users are applauding Compaq's entry, but it may not be an easy sell.

"Compaq's going to have to prove themselves in this market," said Cheryl Currid, president of Currid & Co., a consulting group in Houston. "Users aren't going to buy unless they know they can get the service and support they get from current vendors."

Top dog

Being the market leader in PC sales does give Compaq some leverage. The company has lined up several leading graphics suppliers for the oem machines, including Intergraph Computer Systems, Inc. in Huntsville, Ala., and ELSA, Inc. in Germany. "People will want to work with Compaq because of their size," Currid said.

According to sources familiar with Compaq's plans, the company will offer systems geared for computer-aided design and manufacturing, engineering and three-dimensional graphics applications. The company also plans additional service and support options.

And just as the company has done with SAP AG, Compaq will announce several partnerships with leading workstation software vendors such as Autodesk, Inc. and Mentor Graphics Corp.

Fore takes a swing at Gigabit Ethernet

By Bob Wallace

Fore Systems, Inc.'s announcement last week that it will support Gigabit Ethernet could have been a concession that the new technology is a serious threat to ATM — Fore's forte.

Switching

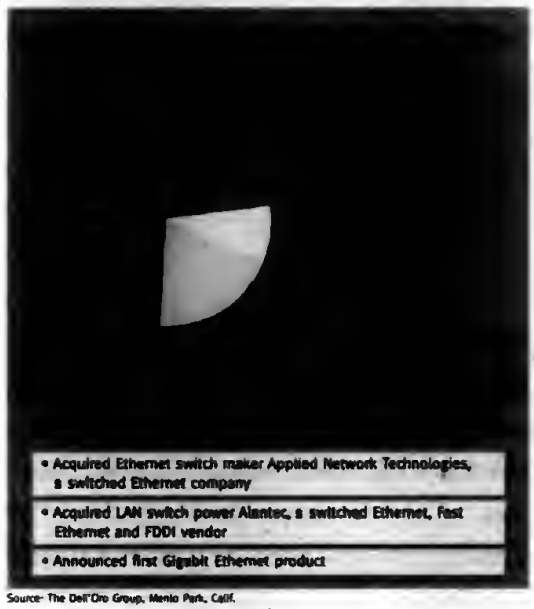
But instead of rolling out a comprehensive strategy to combine Gigabit Ethernet and Asynchronous Transfer Mode (ATM), Fore promised to ship a Gigabit Ethernet uplink for one of its many LAN switches in about a year.

Gigabit Ethernet, which lets Ethernet run at 1G bit/sec. rather than its current maximum of 100M bit/sec., has been hyped as a major competitor to ATM switching. Gigabit Ethernet products haven't shipped yet.

Fore is still betting on the success of ATM but is trying to make its products as attractive as possible by supporting a range of other switching options, analysts said.

But ATM users aren't overly excited about Gigabit Ethernet. "It's just another new technology that will take at least a few years to come to fruition," said Steve Fall, a systems scientist at Computer Sciences Corp. in Huntsville, Ala.

Fore officials said Gigabit Ethernet will probably do fine as an interface for non-time-critical, data-only traffic. But officials said users need ATM to mix voice, data and video on backbone networks. Fore has no plans for Gigabit Ethernet products beyond the promised uplink for its PowerHub 7000 switch, officials said.



Source: The Dell'Oro Group, Menlo Park, Calif.

Office 97 shipment delayed

Excel upgrade to include new collaboration features

By Lisa Picarille

Some users hoping to get an updated version of Microsoft Office under their Christmas trees will have to wait a little longer for their new software suite.

Microsoft Corp. last week announced that the retail shipping date for Office 97 is Jan. 23.

But the Redmond, Wash., software giant still plans to ship in December Office 97 Standard Edition and Professional Edition — along with FrontPage 97 and Team Manager — to its Select corporate customers.

Software suites

Dennis Tevlin, Microsoft's group product manager for Office, declined to give the exact number of Select customers but said "thousands of corporations" subscribe to the Select program. Those corporate users who aren't part of the Select program will have to wait until the end of January for Office 97.

Users looking for new versions of the stand-alone applications that Office 97 includes — Word 97, Excel 97 and Access 97 — will get them in February. The stand-alone versions of PowerPoint 97 and Outlook 97 are delayed until March.

The new version of Excel is expected to make it easier for users to access its features, including the following:

- Custom cells that give users more control over cell size and formatting, and the ability to rotate and size text.
- Shared Workbooks that allow multiple users to simultaneously edit a single workbook. Changes are tracked and logged.
- Web queries that let users bring in data from the Internet or an intranet. The imported information can be analyzed and manipulated.

☑ **Yes,** I want to receive my one copy of **COMPUTERWORLD** each week. I accept your offer of $39.95* per year - a savings of over 73% off the single copy price.

First Name MI Last Name

Title Company

Address City State Zip

Address Shown: ☐ Home ☐ Business ☐ New ☐ Renew Single copy price: $3.00/issue *U.S. Only. Canada $95, Mexico, Central/South America $150, Europe $295, all other countries $295.

Please complete the questions below.

1. BUSINESS/INDUSTRY (Circle one)
10. Manufacturer (other than computer)
20. Finance/Insurance/Real Estate
30. Medical/Law/Education
40. Wholesale/Retail/Trade
50. Business Service (except DP)
60. Government - State/Federal/Local
70. Communications Systems/Public Utilities/Transportation
75. Mining/Construction/Petroleum/ Refining/Agriculture
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90. Computer/Peripheral Dealer/Dist./ Retailer
99. Other _____ (Please specify)

2. TITLE/FUNCTION (Circle one)
IS/MIS/DP MANAGEMENT
10. Chief Information Officer/Vice President/ Asst. VP IS/MIS/DP Management
21 Dir./Mgr. MIS Services, Information Center
22. Dir./Mgr. Network Sys., Data/Tele. Comm., LAN Mgr. /PC Mgr., Tech Planning, Administrative Services
23. Dir./Mgr. Sys. Development, Systems Architecture
31 Programming Management, Software Developers
41 Engineering, Scientific, R&D, Tech. Management
80. Sys. Integrators/VARs/Consulting Mgt.
CORPORATE MANAGEMENT
11 President, Owner/Partner,General Mgr.
12. Vice President, Asst. VP
13. Treasurer,Controller, Financial Officer
DEPARTMENTAL MANAGEMENT
51 Sales & Mktg. Management
70. Medical, Legal, Accounting Mgt.
OTHER PROFESSIONAL MANAGEMENT
60. Information Centers/Libraries, Educators, Journalists, Students
60. Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)
Operating Systems
(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep
App. Development Products ☐ Yes ☐ No
Networking Products ☐ Yes ☐ No

4. How many people are employed at this location and in your entire organization, including all of its branches, divisions and subsidiaries? (Select only one per column.)

	1. At this location	2. Entire Organization
A. 20,000 +	☐	☐
B. 10,000 - 19,999	☐	☐
C. 5,000 - 9,999	☐	☐
D. 1,000 - 4,999	☐	☐
E. 500 - 999	☐	☐
F. 100 - 499	☐	☐
G. 50 - 99	☐	☐
H. 20 - 49	☐	☐
J. 10 - 19	☐	☐
K. 1 - 5	☐	☐

B496 2

☑ **Yes,** I want to receive my one copy of **COMPUTERWORLD** each week. I accept your offer of $39.95* per year - a savings of over 73% off the single copy price.

First Name MI Last Name

Title Company

Address City State Zip

Address Shown: ☐ Home ☐ Business ☐ New ☐ Renew Single copy price: $3.00/issue *U.S. Only. Canada $95, Mexico, Central/South America $150, Europe $295, all other countries $295.

Please complete the questions below.

1. BUSINESS/INDUSTRY (Circle one)
10. Manufacturer (other than computer)
20. Finance/Insurance/Real Estate
30. Medical/Law/Education
40. Wholesale/Retail/Trade
50. Business Service (except DP)
60. Government - State/Federal/Local
70. Communications Systems/Public Utilities/Transportation
75. Mining/Construction/Petroleum/ Refining/Agriculture
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90. Computer/Peripheral Dealer/Dist./ Retailer
99. Other _____ (Please specify)

2. TITLE/FUNCTION (Circle one)
IS/MIS/DP MANAGEMENT
10. Chief Information Officer/Vice President/ Asst. VP IS/MIS/DP Management
21 Dir./Mgr. MIS Services, Information Center
22. Dir./Mgr. Network Sys., Data/Tele. Comm., LAN Mgr. /PC Mgr., Tech Planning, Administrative Services
23. Dir./Mgr. Sys. Development, Systems Architecture
31 Programming Management, Software Developers
41 Engineering, Scientific, R&D, Tech. Management
80. Sys. Integrators/VARs/Consulting Mgt.
CORPORATE MANAGEMENT
11 President, Owner/Partner,General Mgr.
12. Vice President, Asst. VP
13. Treasurer,Controller, Financial Officer
DEPARTMENTAL MANAGEMENT
51 Sales & Mktg. Management
70. Medical, Legal, Accounting Mgt.
OTHER PROFESSIONAL MANAGEMENT
60. Information Centers/Libraries, Educators, Journalists, Students
60. Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)
Operating Systems
(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep
App. Development Products ☐ Yes ☐ No
Networking Products ☐ Yes ☐ No

4. How many people are employed at this location and in your entire organization, including all of its branches, divisions and subsidiaries? (Select only one per column.)

	1. At this location	2. Entire Organization
A. 20,000 +	☐	☐
B. 10,000 - 19,999	☐	☐
C. 5,000 - 9,999	☐	☐
D. 1,000 - 4,999	☐	☐
E. 500 - 999	☐	☐
F. 100 - 499	☐	☐
G. 50 - 99	☐	☐
H. 20 - 49	☐	☐
J. 10 - 19	☐	☐
K. 1 - 5	☐	☐

B496 2

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 55B MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD
P O BOX 2044
MARION OHIO 43306-4144

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 55B MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

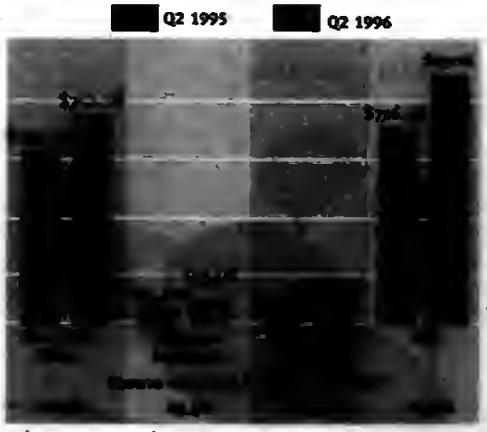
COMPUTERWORLD
P O BOX 2044
MARION OHIO 43306-4144

Computer Industry

SNAPSHOT

Not so suite anymore

Estimated worldwide suite market revenue



Second-quarter worldwide suite revenue increased 24.3% compared with the same quarter of 1995, but a Dataquest report shows a 2.3% dip in second-quarter sales compared with the first quarter of 1996. The report added that these early warning signs "warrant careful attention."

Source: Dataquest, San Jose, Calif.

Amdahl ventures out of glass house

By Michael Goldberg

To skeptics, the name Amdahl simply says "mainframes" — which can mean outdated or niche player.

To others, the vendor's heritage of glass house know-how and trust-filled relationships at large companies put it in a good position to sell new products and services.

Amdahl Corp.'s EnVista Windows NT server line, which started shipping in bulk last month, fits into both camps' arguments.

Some users of the company's System/390-compatible mainframes say Amdahl is on the right track in providing them a comfortable way to insert Microsoft Corp.'s Windows NT into their data centers.

Others wonder whether there are enough of these customers to make the venture into commodity hardware profitable and whether Amdahl can compete in a crowded market against better-known companies such as Compaq Computer Corp. and Hewlett-Packard Co.

Nexis-Lexis in Miamisburg, Ohio, a large Amdahl user, has been coaxing the vendor to venture into Windows NT waters, said systems manager Jeff Biggs.

Biggs said Amdahl can bring a big iron view, with expertise in reliability and performance, to cheaper computer systems. A high-speed connection technology between mainframes and EnVista servers is a good start, he said.

Amdahl's John C. Lewis *wants to 'expand our customers' view of us' beyond being a good hardware maker*

New frontiers

Amdahl "is evolving by what they're doing. We're all realizing that the industry is changing. ... They're the first ones [among mainframe vendors] who want to" emphasize a Windows NT strategy, Biggs said.

Joe Barkan, an analyst at Gartner Group, Inc. in Stamford, Conn., said Amdahl wisely packages EnVista servers with services aimed at certain applications — Internet, Notes groupware and database engines, for example.

But will these moves bring growth and profits?

"The [Amdahl] name and what it represents is generally mainframes, not NT or distributed solutions. It's not going to be a mass-market sell," Barkan said. It could take time for Amdahl to show it has in-house expertise in Windows NT, he added.

A core business at the Sunnyvale, Calif., company remains System/390-compatible machines, and Amdahl has a new line of air-cooled Millennium Global Servers due in the fourth quarter to compete with IBM and Hitachi Data Systems Corp.

Aside from mainframes, Amdahl has boosted its open systems business with new storage disk arrays and by reselling Sun Microsystems, Inc. SPARC servers. And with the acquisition in the past year of two technology consulting companies — DMR Group, Inc. and Trecom Business Systems — Amdahl hopes to make systems implementation services key to its growth.

Amdahl's challenge is to "expand our customers' view of us" beyond being a good hardware maker, said chairman and CEO John C. Lewis.

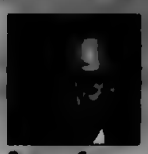
Those customers have been the largest information systems shops. "In the past, their needs have been relatively easy to understand — [all] built around the System/390," Lewis said.

"Now they're faced with a significant number of technological challenges. We felt it was critical for us to expand our offerings" to coincide better with users' needs, Lewis said. "We're changing just like our customers. It's going well, but it's painful."

Briefs

Cray critical after crash

Supercomputer pioneer Seymour Cray remained in critical but stable condition late last week following an automobile accident that was blamed on a careless driver. Cray, 70, broke his neck and suffered severe head injuries in the accident near his home in Colorado Springs.



Seymour Cray

The reclusive but brilliant inventor designed prototypes for the Univac 1100 series in the early 1950s, built the fastest computer in the world at Control Data Corp. in the early 1960s and did the same again at Cray Research, Inc. in the 1970s and 1980s. In the early 1990s, Cray stumbled at the helm of Cray Research spin-off Cray Computer Corp. when he was unable to get the bugs out of his radical new gallium arsenide processors in time to beat the competition.

Cray Computer was also hammered by post-Cold War budget cuts at the Pentagon and U.S. Department of Energy, the biggest buyers of supercomputers.

Asked in a rare press interview in 1994 which of his many accomplishments pleased him the most, Cray told *Computerworld*, "The first thing I designed that I think was kind of outstanding was the Control Data 6600. At that time, IBM imagined themselves as going to completely dominate the scientific computing market. But the 6600 was quite successful, and I know that caused frustration among the IBM folks. There's satisfaction at having a little company be successful where a big one seems not able to."

Borland exec quits

Just as Borland International, Inc. announced the interim appointment of Whitney Lynn as acting president and CEO, the company's senior vice president of research and development, Paul Gross, jumped to rival Microsoft Corp.

Gross will join Microsoft's Internet Platform and Tools division. Gross' resignation is a significant loss for Borland and is another sign that the Scotts Valley, Calif., company is continuing to have trouble reinventing itself, said Michael Gerua, an industry analyst at a division of Donaldson, Lufkin & Jenrette Securities Corp. "It's always tough to re-engineer a mature business," Gerua said. "But in the fast-changing PC business dominated by Microsoft, Borland has had an especially difficult time."

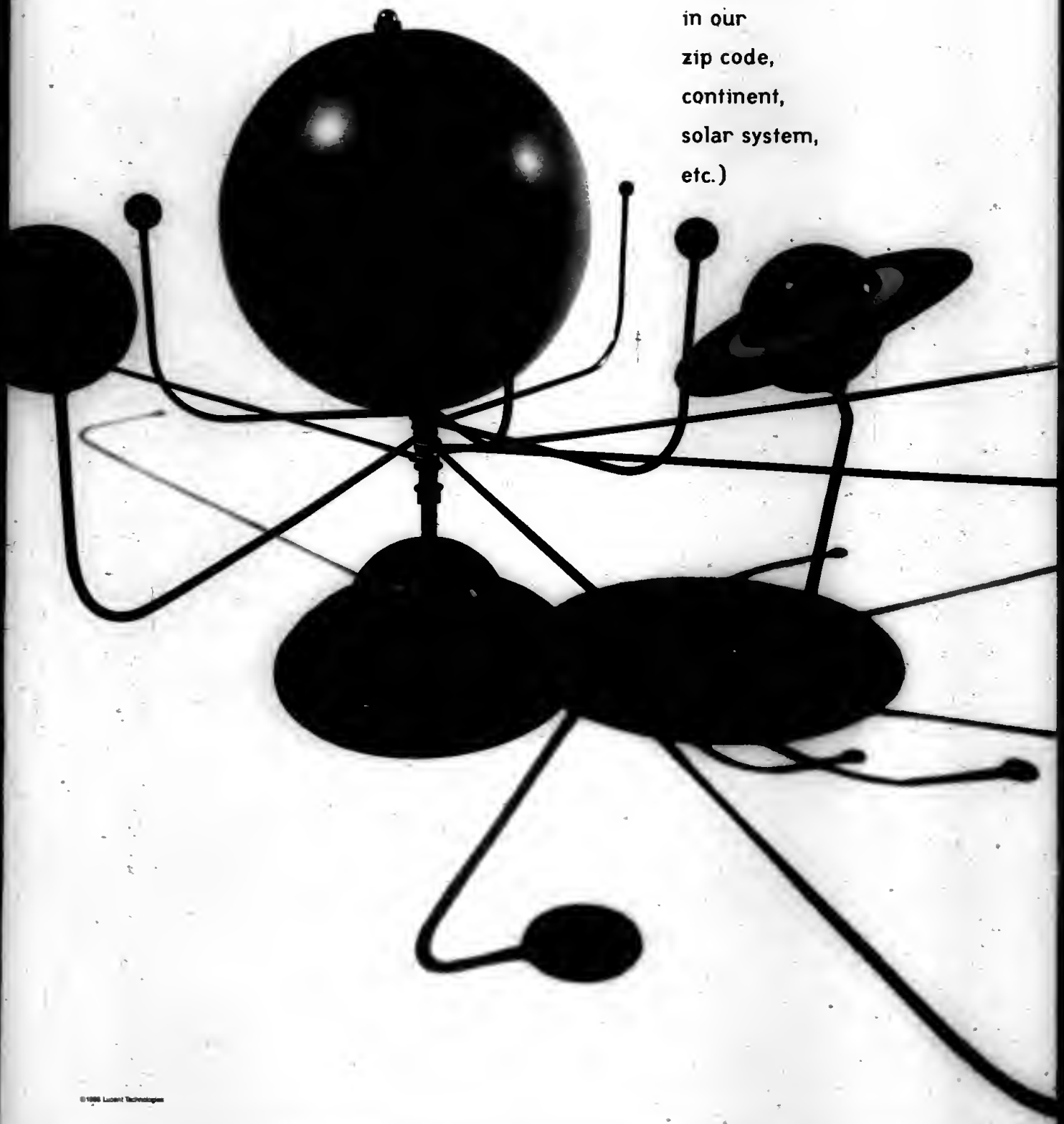
AT&T's stock drops

News that AT&T Corp. expects its third-quarter earnings to sag caused investors to send the stock on a 9.8% nosedive last week. AT&T's shares fell $5.63 to $51.50 Tuesday on the New York Stock Exchange composite.

The company blamed the expected weak results on the loss of consumer long-distance business and increased spending on its network and marketing. AT&T officials forecasted little improvement for the fourth quarter.

first on our block.

(also first
in our
zip code,
continent,
solar system,
etc.)



©1998 Lucent Technologies

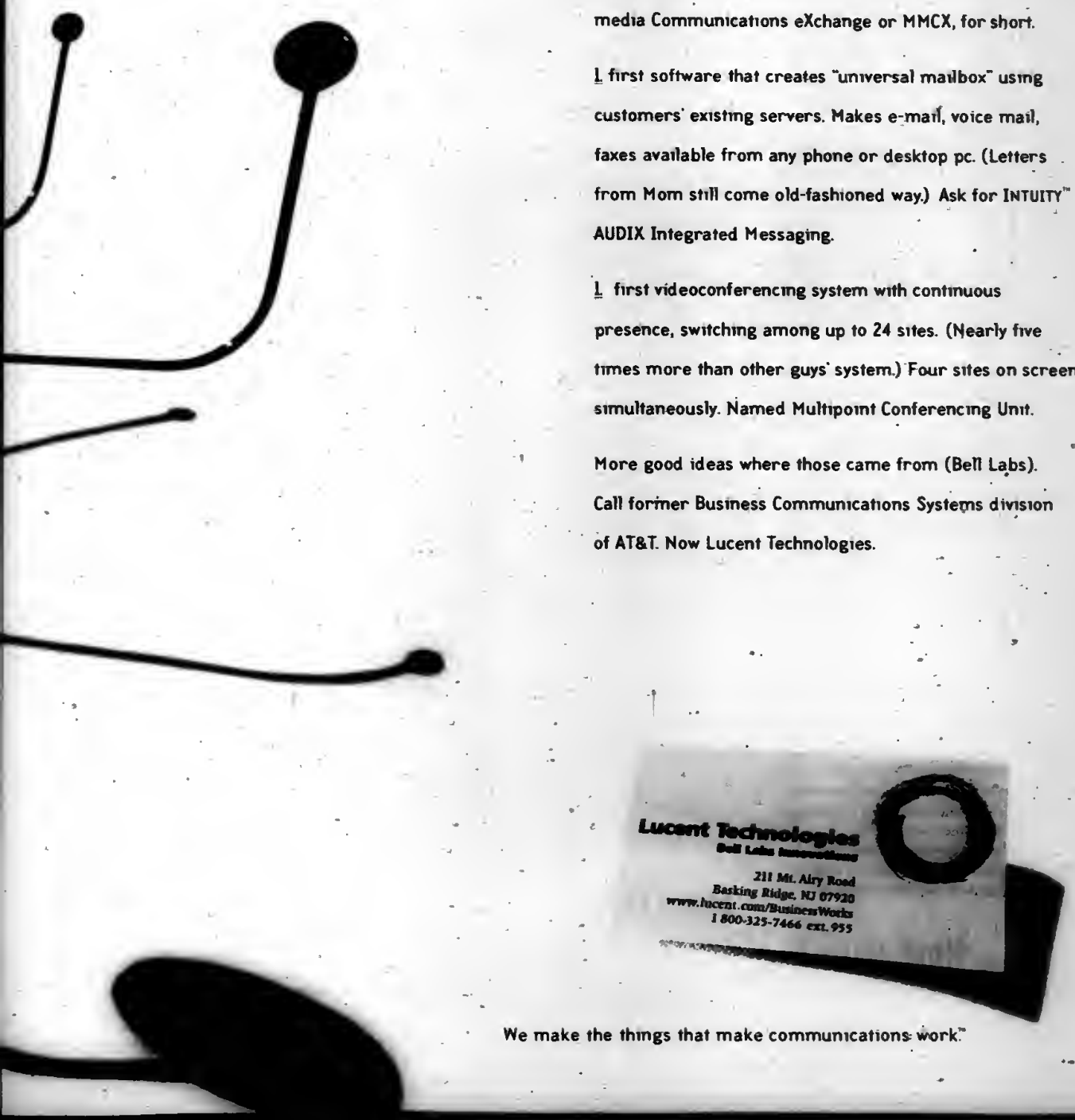
Now available:

1 first multimedia conferencing system that brings together people on different communications devices (e.g., groups on workstations in N.Y. and L.A. can meet with a lucky dog on a cell phone in Aspen). Named Multimedia Communications eXchange or MMCX, for short.

1 first software that creates "universal mailbox" using customers' existing servers. Makes e-mail, voice mail, faxes available from any phone or desktop pc. (Letters from Mom still come old-fashioned way.) Ask for INTUITY™ AUDIX Integrated Messaging.

1 first videoconferencing system with continuous presence, switching among up to 24 sites. (Nearly five times more than other guys' system.) Four sites on screen simultaneously. Named Multipoint Conferencing Unit.

More good ideas where those came from (Bell Labs). Call former Business Communications Systems division of AT&T. Now Lucent Technologies.



We make the things that make communications work.™

Opinion

Video veto

My desk is a total mess.

Mountain ranges of trade magazines, junk mail and faxes grow like active volcanoes.

The valleys are dotted with empty Diet Pepsi cans, half-eaten candy bars, plastic utensils and an empty fruit bowl.

I don't feel like I'm looking my best today, either. My hair could use a trim, I cut myself shaving this morning, and the bags under my eyes are truly frightening

Which is why desktop videoconferencing will never take off. And that goes for the technologies that were designed to carry voice and video to the corporate desktop — namely Integrated Services Digital Network and 25M bit/sec. Asynchronous Transfer Mode.

The price of a complete desktop video setup has come down to less than $1,500. Desktop video cameras can be had for about $250.

And point-to-point videoconferencing demonstrations were taking place all over the show floor at Networld/Interop '96 in Atlanta.

I saw one interested, but suspicious, showgoer stand in front of a video display and order his buddy to stand in front of the second camera, which was around the corner. The buddy was told to put his hand over the camera lens. The first showgoer then waited for his own screen to turn blank.

The delay was a full eight seconds.

But it doesn't really matter how good the systems get at shortening delays and matching the pictures with the sound. And it doesn't matter how inexpensive the systems get. This is technology that adds nothing to the conversation. It doesn't make anything happen faster, cheaper or better.

The telephone works just fine for communicating and transacting business. It's reliable, and I don't have to reserve a line in advance or wonder if the person on the other end has a compatible phone. Electronic mail has its advantages because I don't have to deal with busy signals or time zones.

But the main reason videoconferencing won't take off is because it violates one of the basic rules of human nature. It's the one that says people don't like to be on camera. And they especially don't like a video camera staring down at them from atop their PC.

Forget about Internet privacy; the issue here is in-your-cubicle privacy. And my guess is users will continue to come down on the side of the video veto.

Neal Weinberg

Neal Weinberg, *assistant news editor*
Internet: *neal_weinberg@cw.com*

Letters to the editor

Pay at start-ups no laughing matter

I got a good laugh from Alan Lees' letter ["Start-ups do offer competitive pay," CW, Aug. 19] that said it's no longer true that start-ups offer "skimpy salaries and minimal benefits."

In the past three years, my husband went to work for one start-up, and I went to work for two others. My husband has been well-paid, and, aside from switching from a great HMO to a standard medical insurer, his benefits have gotten better. I was reasonably well-paid at both start-ups, but the benefits were pretty skimpy. However, the engineers were so underpaid, they bolted as soon as a halfway decent offer came their way.

It seems to many of us who've worked in corporate America in the '90s that the only people who matter are the stockholders. Many of us would love to work for a company where quality products and services, a challenging work environment and listening to the customers mattered.

Until that happens, I predict the number of one-person consulting groups will skyrocket.

Laurie D. T. Mann
GetOnline
Pittsburgh

States' rights

Your article "States eye online revenues" [CW, Aug. 19] raises interesting questions about ownership of and public access to publicly collected data. Contrary to Mike Humphrey's assertion that "local governments have no incentive to develop these kinds of applications unless they can recoup some of the costs of making them available," governments develop these systems when it furthers the efficiency of government. If they are doing it solely to generate revenue by selling information collected about individuals, then one must question why the government needed that information in the first place.

I would take great offense if my county decided to use tax revenue to build a system merely to reduce the inconvenience of someone seeking the same information.

Walt Roberts
Dexter, Mich.

Security maxim

Security journalists and the experts they consult and quote still don't get it ["Selling Security," CW, Aug. 26]. A business will never have more than cosmetic information security until security is included in job performance and annual performance appraisals. It must become a part of job performance and not be considered in conflict with it.

Otherwise, training, selling and advising users with [Deloitte & Touche's William Hugh] Murray's strictness or [Detroit Edison's Tom] Peltier's tolerance education [users] on how to avoid the security they hate. That gets in the way of higher job performance and the commensurate rewards we all seek.

Dean B. Parker
Menlo Park, Calif.

'Leader' disputed

We at Interleaf read with some surprise the guest column by Chuck Phillips of Morgan, Stanley and Co. ["Weaving a Web of documents," CW, Aug. 19].

We agree with Phillips' central premise that the rapid acceptance of the World Wide Web is creating oew capabilities and opportunities in the document management market. Still, we want to correct some inaccurate information.

Phillips states (without supporting data) that Documentum, Inc. is "the leader in' the document management market." We must disagree.

According to two recent independent market surveys by International Data Corp. and Delphi Consulting Group, Interleaf, Inc. is the dominant vendor in that market. Interleaf has twice the market share of Documentum.

Also, Documentum may have anoounced Accelera, its Web product, "significantly ahead" of some competitors, but it didn't beat Interleaf. As reported in the Jan. 29 issue of *Computerworld*, Interleaf announced its Intellecte/BusinessWeb product the same day Accelera was announced.

Pat Byrne
Interleaf, Inc.
Waltham, Mass.

■ Computerworld welcomes comments from its readers. Letters shouldn't exceed 200 words and should be addressed to Maryfran Johnson, Executive Editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax number: (508) 875-8931; Internet: letters@cw.com. Please include an address and phone number for verification.

Video veto

My desk is a total mess.

Mountain ranges of trade magazines, junk mail and faxes grow like active volcanoes.

The valleys are dotted with empty Diet Pepsi cans, half-eaten candy bars, plastic utensils and an empty fruit bowl.

I don't feel like I'm looking my best today, either. My hair could use a trim, I cut myself shaving this morning, and the bags under my eyes are truly frightening.

Which is why desktop videoconferencing will never take off. And that goes for the technologies that were designed to carry voice and video to the corporate desktop — namely Integrated Services Digital Network and 25M bit/sec. Asynchronous Transfer Mode.

The price of a complete desktop video setup has come down to less than $1,500. Desktop video cameras can be had for about $250.

And point-to-point videoconferencing demonstrations were taking place all over the show floor at Networld/Interop '96 in Atlanta.

I saw one interested, but suspicious, showgoer stand in front of a video display and order his buddy to stand in front of the second camera, which was around the corner. The buddy was told to put his hand over the camera lens. The first showgoer then waited for his own screen to turn blank.

The delay was a full eight seconds.

But it doesn't really matter how good the systems get at shortening delays and matching the pictures with the sound. And it doesn't matter how inexpensive the systems get. This is technology that adds nothing to the conversation. It doesn't make anything happen faster, cheaper or better.

The telephone works just fine for communicating and transacting business. It's reliable, and I don't have to reserve a line in advance or wonder if the person on the other end has a compatible phone. Electronic mail has its advantages because I don't have to deal with busy signals or time zones.

But the main reason videoconferencing won't take off is because it violates one of the basic rules of human nature. It's the one that says people don't like to be on camera. And they especially don't like a video camera staring down at them from atop their PC.

Forget about Internet privacy; the issue here is in-your-cubicle privacy. And my guess is users will continue to come down on the side of the video veto.

Neal Weinberg

Neal Weinberg, *assistant news editor*
Internet: *neal_weinberg@cw.com*

Pay at start-ups no laughing matter

I got a good laugh from Alan Lees' letter ["Start-ups do offer competitive pay," CW, Aug. 19] that said it's no longer true that start-ups offer "skimpy salaries and minimal benefits."

In the past three years, my husband went to work for one start-up, and I went to work for two others. My husband has been well-paid, and, aside from switching from a great HMO to a standard medical insurer, his benefits have gotten better. I was reasonably well-paid at both start-ups, but the benefits were pretty skimpy. However, the engineers were so underpaid, they bolted as soon as a halfway decent offer came their way.

It seems to many of us who've worked in corporate America in the '90s that the only people who matter are the stockholders. Many of us would love to work for a company where quality products and services, a challenging work environment and listening to the customers mattered.

Until that happens, I predict the number of one-person consulting groups will skyrocket.

Laurie D. T. Mann
GetOnline
Pittsburgh

States' rights

Your article "States eye online revenues" [CW, Aug. 19] raises interesting questions about ownership of and public access to publicly collected data. Contrary to Mike Humphrey's assertion that "local governments have no incentive to develop these kinds of applications unless they can recoup some of the costs of making them available," governments develop these systems when it furthers the efficiency of government. If they are doing it solely to generate revenue by selling information collected about individuals, then one must question why the government needed that information in the first place.

I would take great offense if my county decided to use tax revenue to build a system merely to reduce the inconvenience of someone seeking the same information.

Walt Roberts
Dexter, Mich.

'Leader' disputed

We at Interleaf read with some surprise the guest column by Chuck Phillips of Morgan, Stanley and Co. ["Weaving a Web of documents," CW, Aug. 19].

We agree with Phillips' central premise that the rapid acceptance of the World Wide Web is creating new capabilities and opportunities in the document management market. Still, we want to correct some inaccurate information.

Phillips states (without supporting data) that Documentum, Inc. is "the leader in the document management market." We must disagree.

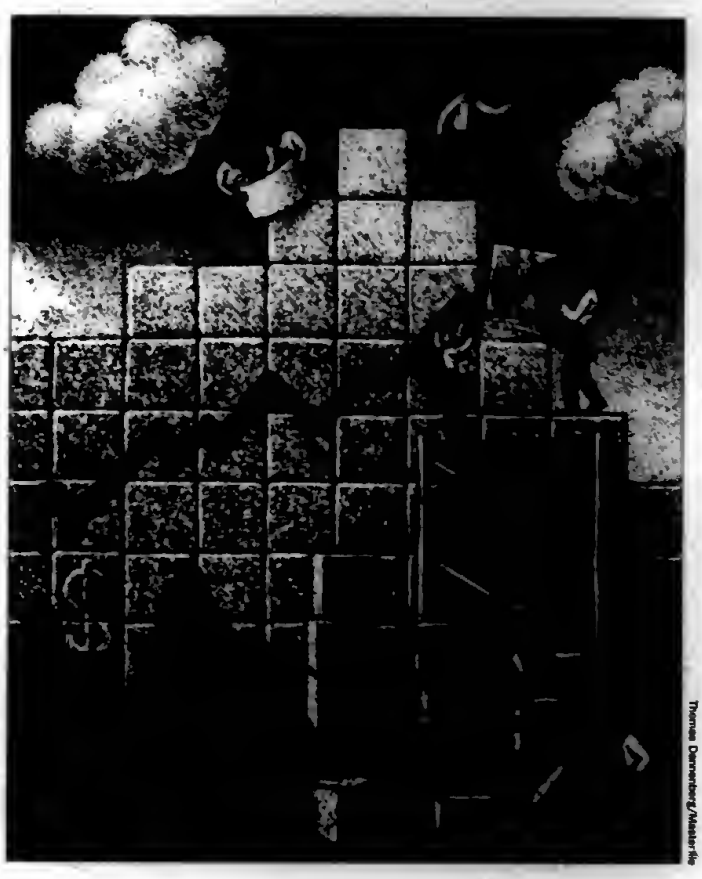
According to two recent independent market surveys by International Data Corp. and Delphi Consulting Group, Interleaf, Inc. is the dominant vendor in that market. Interleaf has twice the market share of Documentum.

Also, Documentum may have announced Accelera, its Web product, "significantly ahead" of some competitors, but it didn't beat Interleaf. As reported in the Jan. 29 issue of *Computerworld*, Interleaf announced its Intellecte/BusinessWeb product the same day Accelera was announced.

Pat Byrne
Interleaf, Inc.
Waltham, Mass.

■ Computerworld welcomes comments from its readers. Letters shouldn't exceed 200 words and should be addressed to Maryfran Johnson, Executive Editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax number: (508) 875-8931; Internet: letters@cw.com. Please include an address and phone number for verification.

Microsoft's Corporate Solutions Program



Thomas Dannenberg/Master file

Helping companies meet their challenges and realize their potential

COMPUTERWORLD
CUSTOM PUBLICATIONS

Dear IT Professional:

Steve Ballmer
Executive Vice President
Microsoft Corporation

There's no need to tell you that we're deep into the information Age. The Web, e-mail, intranets, client/server applications — you've seen them all in your corporation. Or you've been concerned that you had to get them to stay competitive. But how do you cut through the noise and implement the best technology?

It's no easy task when your corporation's information sits on a variety of databases, legacy systems, and platforms. With change as inevitable as the approach of the new millenium, your technology decisions also have to be flexible enough to embrace tomorrow's fast-paced innovations.

That's where Microsoft stands out from the ordinary. We understand the competitive nature of business, how the right technology is crucial to success, and how technology products — regardless of vendor — must work together to enable it.

This means we don't just sell products. We sell solutions. To do it well, we partner with thousands of independent Microsoft Solution Providers worldwide to make sure our technologies solve real business problems — and help businesses stay nimble in the future.

We listen to our customers, too. They tell us they want reliable information without a lot of clutter. That's why we've launched the Corporate Solutions Program. In this program, we inform decision makers like you about our strategies and products, so you can make the best technology choices. It's a major new initiative designed to give you an inside look at where Microsoft is headed — and a heads-up on the competitive advantages you can expect from implementing Microsoft solutions.

The Corporate Solutions Program — What's in It for You?

This program is your personal link to Microsoft. In intensive briefings, you'll hear from our representatives and from your local Solution Providers how to drive down costs and boost productivity for quick, consistent

Microsoft®

bottom-line results.

You will also see real-world examples of the dividends Microsoft solutions are paying for companies today. You can even get a free on-site evaluation of Microsoft's entire line of technologies through the Microsoft Corporate Solutions Pilot Program.

Why Microsoft for corporations?

Microsoft solutions deliver superior client/server performance at a low cost of purchase and ownership. With their intuitive user interface, Microsoft Windows technologies reduce support and training costs dramatically.

Windows is also a time-tested and proven platform for development, so you have the power of choice. Leading independent developers in every industry offer sophisticated line-of-business software for Windows. In addition, tight integration across Windows server products, and between server and desktop Windows systems, makes it easier to develop your own applications.

You'll also find that Microsoft Windows NT® and the BackOffice™ family of server products interoperate smoothly with your legacy systems. That means you protect IT investments, even as you free up the flow of mission-critical information.

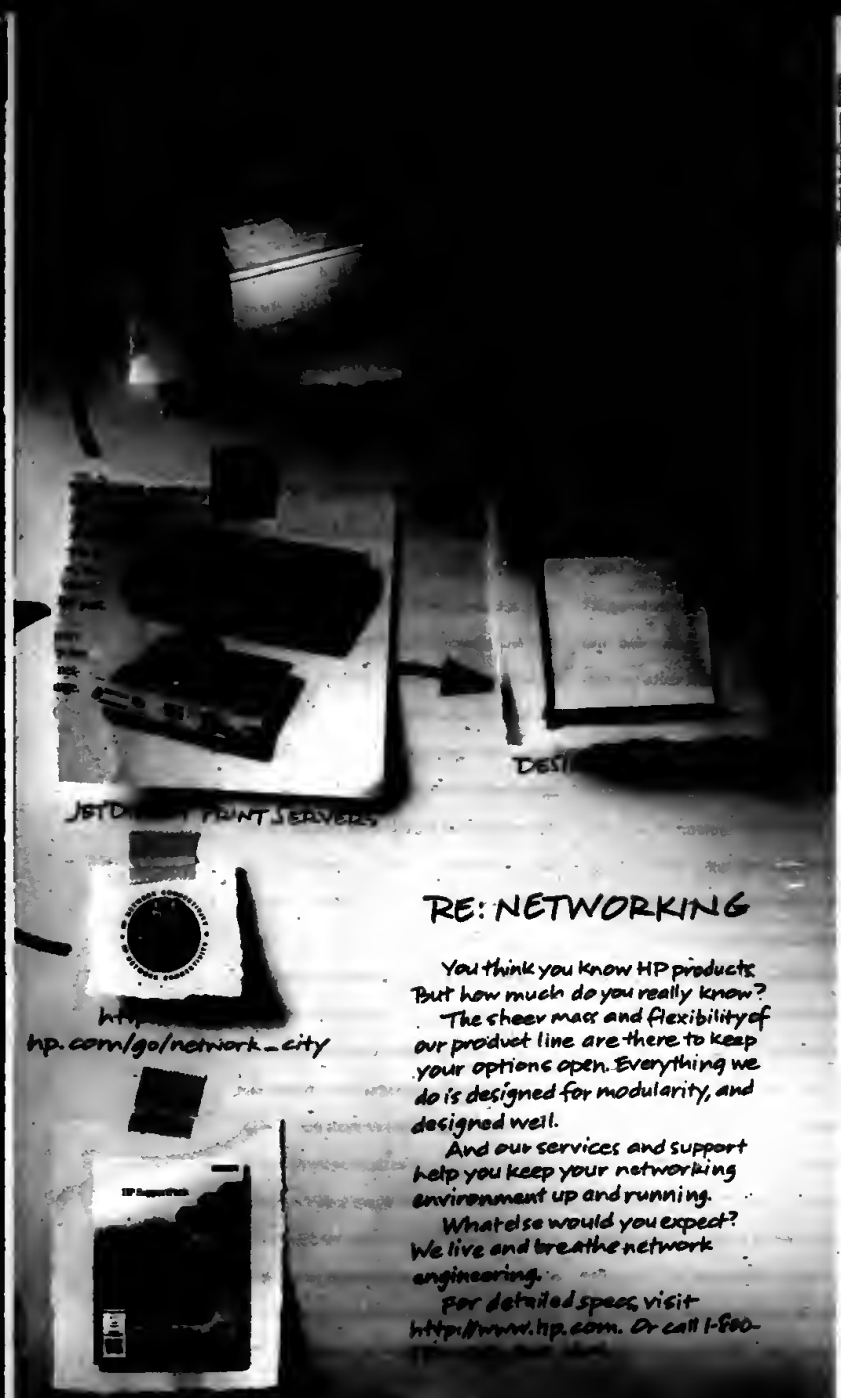
Of course, Microsoft's entire product line has been optimized to support corporate Internet and intranet solutions. From HTML editors to Web browsers to server software, Microsoft offers everything businesses need to build and maintain engaging, interactive on-line sites.

Simply put, Microsoft technologies make it faster and easier to get real business returns from every kind of information technology.

Microsoft — look again!

As an introduction to the Corporate Solutions Program, please take a look at the stories that follow. You'll see how Microsoft is helping corporations of all kinds turn their business goals into realities.

OPENVIEW
ADAPTER CARDS



RE: NETWORKING

You think you know HP products. But how much do you really know?

The sheer mass and flexibility of our product line are there to keep your options open. Everything we do is designed for modularity, and designed well.

And our services and support help you keep your networking environment up and running.

What else would you expect? We live and breathe network engineering.

For detailed specs, visit http://www.hp.com. Or call 1-800-

HEWLETT® PACKARD

Companies use Wang to improve business processes

For three companies, fewer people, fewer steps lead to more efficient customer service and better responsiveness.

We made back our original $1 million investment in the AWS in just the first year

As Microsoft's preferred provider of imaging and workflow software, Wang is uniquely positioned to help its customers improve their business processes. Wang's OPEN/image and OPEN/workflow products on NT offer scalability across the enterprise, the flexibility needed to easily integrate the system into current environments, and a platform that offers superior price/performance and power.

ConEd plugs into Wang

Customer service reps at power utility Consolidated Edison of New York used to manage more than 1 million pieces of customer correspondence manually each year. Managers had difficulty tracking the status of a given customer inquiry.

To alleviate the problem, ConEd implemented its Automated Workflow System (AWS), based on Wang OPEN/workflow and OPEN/image running on Microsoft NT® and using Microsoft SQL Server™.

The AWS is used by more than 600 customer service reps. "We manage our customer interactions more efficiently, involving fewer people in the process and fewer steps along the way," says Ed Glister, who led the deployment. "We're serving our customers better under the new system."

ConEd quickly recovered its substantial investment in software and hardware. Says Glister, "We made back our original $1 million investment in the AWS in just the first year, and estimate overall cost savings at over $2 million per year."

WANG

IGT hits imaging jackpot

International Game Technology (IGT) is a leader in the design, development and manufacture of microprocessor-based gaming products and software systems, such as slot machines and video poker systems.

Recently, IGT project leader Cindy Nelson and her team chose Wang's OPEN/image and OPEN/workflow running on Microsoft NT® Server to replace an outdated imaging system that required IGT to maintain hard copy documents on-site as well as electron-

icnily, menning thousands in lost savings each ynnr.

Sincn IGT had ntnndnrdized nn NT, it made sense to work with Wang. One nxample: Every NT user will be able to view, mail, ncnn nnd print imaging filas using Microsofte Imaging for Windowse, an imaging viewer developed by Wang and included as n standard component of Windowse 95 and Windows NTe Workstation.

The projects at IGT are still in the early phases, but Nelson is enthusiastic about the initial successes. "We can handle more volume with fewer peopin," she says. "Wn will be able to access customnr informntinn quickly, nnd increase turnaround, resulting in better service and responsiveness."

Nnlson was highly imprennnd with Wnng'n nnrvicn. "Wang cinnrly dnmnnstrated their commitment to us," she says. "They set n new standard for how I axpect other vendors to support us in the future."

Norwich Savings banks on Wang

The Norwich Savings Society, in Norwich, Conn., is using Wang OPEN/Image to capture and manage documentation for individual retirement accounts.

"Wang set a new standard for how I expect other vendors to support us in the future."

"Previously, we relied on n bank of rotary files that covered the wall of n good-sized room," says Richard W. Dennison, senior VP of nystems and operations at Norwich Savings. "With Wang OPEN/Image, we plan to move the hard copy files off-site. Later, we plnn tn incinde processing of nignatnrn cards and safe deposit documentation."

Knowing that Microsoft and Wang are working together has had n major impact an Dennison'n decision. "It was critical to know that both Wang and Microsoft planned future development relating to these products," he says. "Mereover, Wang and Microsoft are setting the open standards for imaging and workflow on NT, ac we know we will be prepared for what the future holds."

"Wang and Microsoft are setting the open standards for imaging and workflow on NT."

Working together

As part of the agreement between Wang and Microsoft, which began in April, 1995, Wnng was named Microsoft's preferred provider of imaging and workflow systems. The two are working together to offer the best open applications solutions from Wang for use on Microsofte BackOffice™/NT.

Clearly, the alliance between Wang and Microsoft is already helping to define the market and set standards that help customers evaluate and select imaging, workflow and storage solutions.

This piece was written by Ellen Rome, director, Wang/Microsoft Alliance, Wang Software. Wang can be contacted at www.wang.com.

Software infrastructure helps New Brunswick Power move into a brighter future

With an eye to the long term, Canadian utility selects SAP and Microsoft as solution vendors.

New Brunswick Power has provided electricity to customers throughout its nameseke Canadian province since 1920. It currently operates 17 generation stations.

Recent regulatory changes have led to a far more deregulated and competitive environment, prompting the utility to reevaluate its business processes, particularly its customer service functions. However, in the course of this reevaluation, the company quickly realized that its existing software and system infrastructure lacked the functionality and flexibility needed to meet its changing business needs.

By exploiting the robustness of SQL Server, New Brunswick Power was able to merge three inventory systems into one.

After comparing potential solutions, New Brunswick Power realized that its needs would best be met by implementing standard software applications on a client/server system. To ensure that the technology it chose would be viable for at least the next ten years, the utility decided on SAP R/3 and Microsoft® SQL Server™ with Microsoft's Windows NT® Server operating system.

New Brunswick Power chose SAP R/3 for the product's integration, as well as SAP's commitment to creating solutions geared to the utilities industry and its ability to provide ongoing support. The company deployed R/3's financial (FI), controlling (CO), materials management (MM) and parts of purchasing and accounts payable (AP) applications. "One of the major advantages in going with SAP R/3 was the integration across platforms," says Gerry Schwartz, manager of computer services for New Brunswick Power. "Also, we believe that SAP has demonstrated their long-term commitment to the product."

"One of the major advantages in going with SAP R/3 was the product's integration across platforms."

Microsoft SQL Server and Windows NT Server were also chosen by the utility with an eye to the future. SQL Server has been optimized to run on Windows NT Server and offers an integrated operating platform.

Implementing R/3 on Windows NT and SQL Server allowed the utility to reorganize many internal business processes. And by exploiting SQL Server's robustness, the utility was able to merge three inventory systems into one, eliminating data duplication and reducing inventory levels.

Soon, your net profits could include Internet profits.

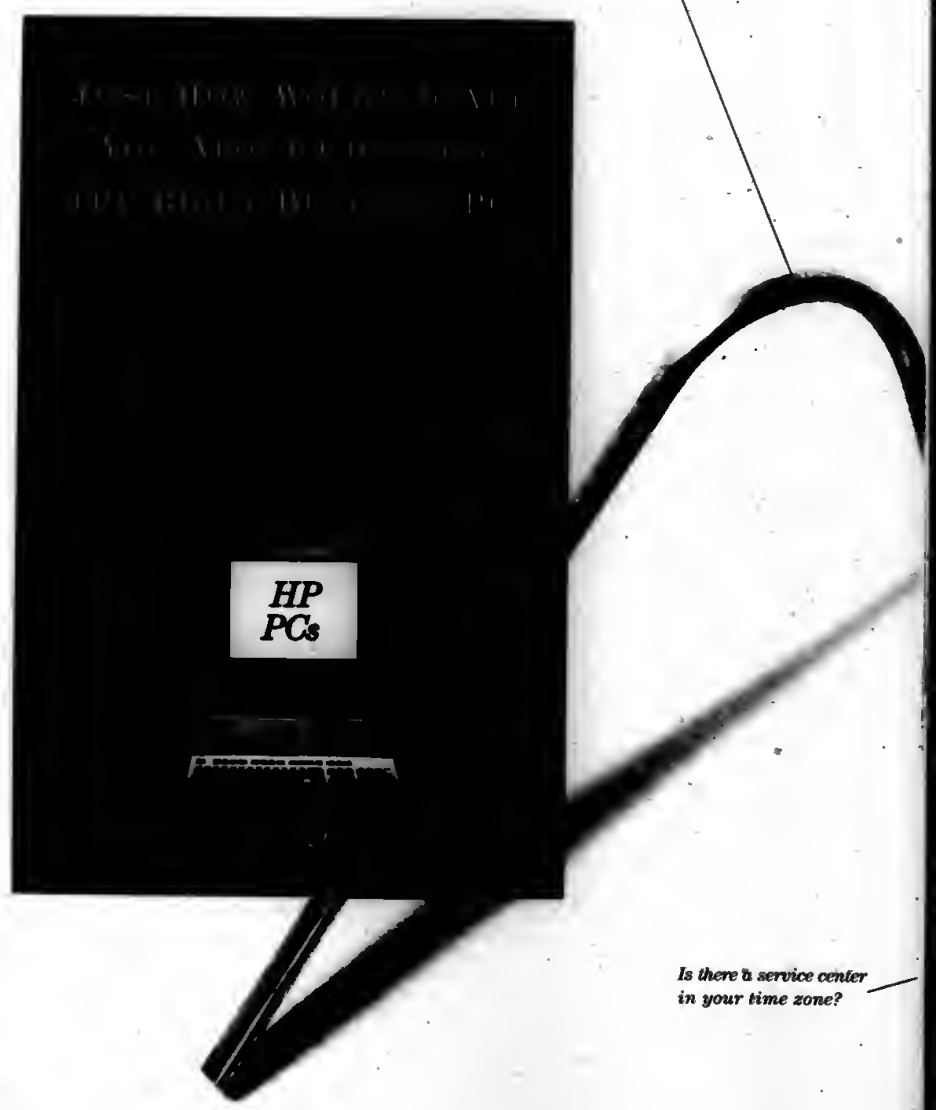
An anticipated $150 billion will change hands over the Internet by the year 2000. SAP can make sure one of those hands is yours. A joint effort with Microsoft® now makes Internet and intranet commerce a profitable reality, with SAP's R/3 business processes available on a common platform on-line. Both customer-to-business and business-to-business transactions can be conducted completely electronically. It's fast, it's secure, it's revolutionary, and it has the potential to change the way you do business. After all, the Internet is the largest single source of information in the world today. And no company knows how to give you a better return on information than SAP.

SAP *A Better Return On Information™*

To find out how SAP software is helping more than 6,000 businesses do business better, call 1-800-283-1SAP, or visit us at http://www.sap.com.

All SAP references herein are the registered or unregistered trademarks of SAP AG. All other products or companies mentioned in this advertisement may be the registered or unregistered trademarks of their respective companies and are hereby acknowledged. Copyright 1996 SAP America, Inc.

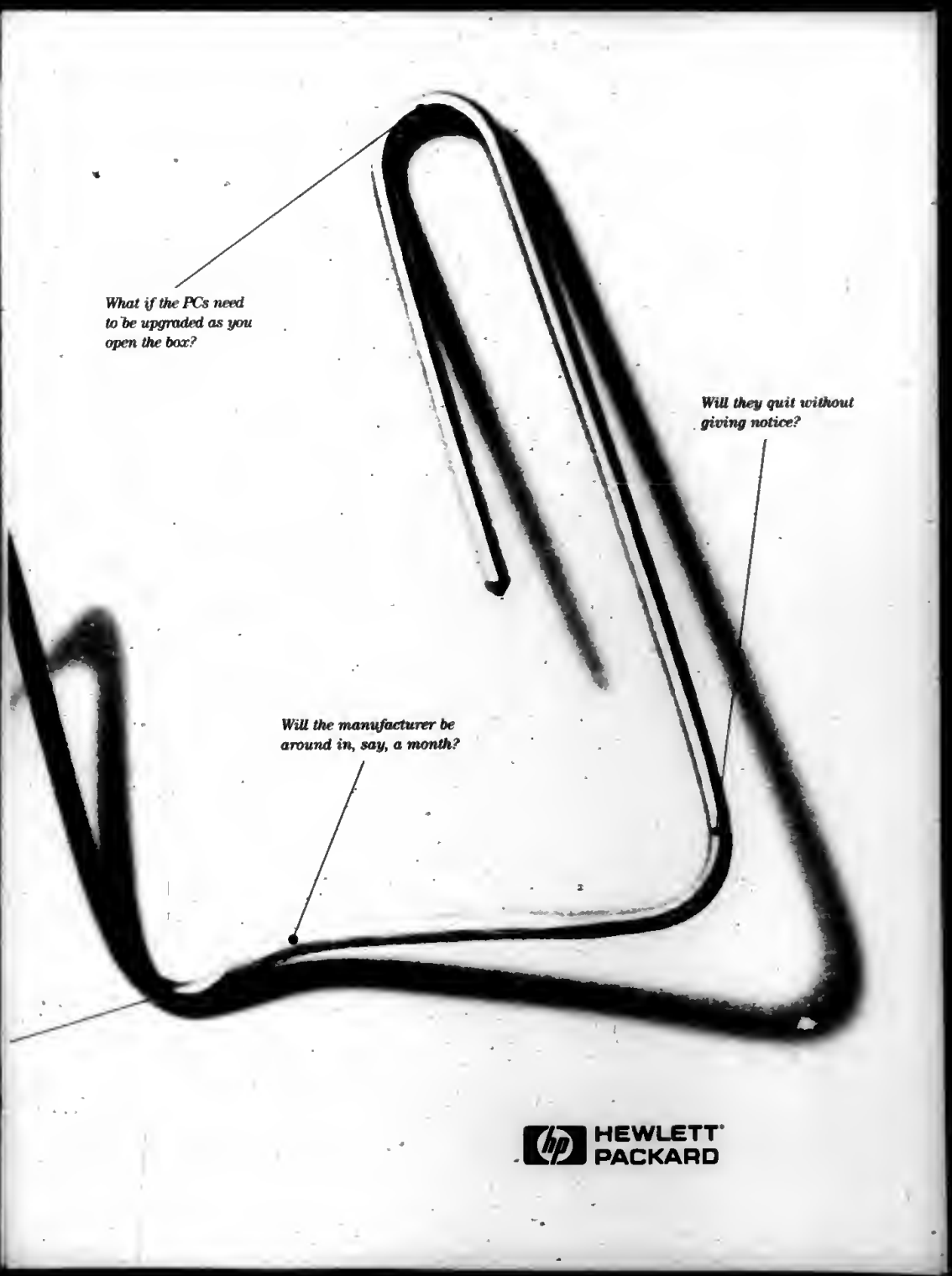
Will you need to issue new stock to afford them?



Is there a service center in your time zone?

intel inside
pentium processors

*In Canada, call 1-800-387-3867. †Starting U.S. street price for HP Vectra VE2. Monitor not included. The Intel Inside logo and Pentium are registered trademarks of Intel Corporation. ©1995 Hewlett-Packard Company. PP5401



HEWLETT PACKARD

Verdict on dual deployment of Office Suite and PC DOCS goes in user's favor

The old adage about killing two birds with one stone helps a San Francisco law firm.

Morrison & Foerster, a San Francisco-based international legal firm, has experienced tremendous growth over the past ten years. To maintain its competitiveness, its lawyers had to reduce turnaround time on documents, had to be able to locate the latest copy of any contract immediately, had to know who had made what revisions to which document, had to have quicker access to case-related information, and had to do more with fewer administrative resources.

To achieve all this, the firm deployed NT as its network operating system, the Microsoft Suite of applications, and then decided to implement PC DOCS as its document management solution. Rollout of the technical infrastructure began in mid-April 1995, and was completed by mid-July.

"The added complexity of installing PC DOCS over Microsoft Office was not that great."

All in all, the firm rolled out 55 Microsoft NTs servers and 1400 workstations to nine offices in less than three months. All the workstations were configured with PC DOCS and the Microsoft Office Suite. The firm then added Microsoft Mail and Microsoft Schedule+. Training was completed during evenings, lunch breaks or on weekends.

Many law firms do not realize the need for document management until they have moved to their new personal productivity applications. Others elect to implement personal productivity tools, then implement document management over time. Morrison & Foerster opted to implement personal productivity applications in conjunction with the document management solution. "All too often, law firms do this as a two-step process," says Nancy Markley, director of technology. "But the added complexity of installing PC DOCS over and above Microsoft Office for us was not that great."

As users retrieve documents from the legacy system, the conversion utility translates the documents into Microsoft Word and archives them on the PC DOCS system.

Despite its rapid deployment, Morrison & Foerster experienced little disruption. It also learned a key lesson for law firms: when moving to Microsoft Windows, do document management at the same time!

DuPont employs PC DOCS to streamline [illegible] process

DuPont deploys Microsoft and PC DOCS products to meet its modest goal: becoming the most efficient company in the world.

DuPont and Co., a global chemical and energy corporation based in Wilmington, Del., had to get its many manufacturing facilities to meet the government's stringent regulatory policies and achieve ISO 9000 certification.

Prior to PC DOCS, DuPont's internal plant operating policies were implemented under a manual process. A safety manager wrote a recommendation by hand, had it typed, then distributed it to the team for review. After all team members mailed back their edits as paper, the document was retyped and redistributed. Once approved by everyone, it was copied and disseminated to line managers for training. Finally, once training was completed, the recommendation was inserted into 14 binders for the documentation.

This process involved tremendous administrative overhead as well as many chances for making keying mistakes. In addition, the change cycle often took several weeks. DuPont deployed Microsoft's Windows NT® as a document management server and PC DOCS as its document management solution and changed all of this.

Safety managers now manage their recommendations in PC DOCS, then e-mail them to other team members, who make their edits electronically. PC DOCS automatically consolidates the team's input. Once the edits are complete, the file is printed and distributed to the line workers for training.

The result is that now, the safety team spends more time on content, accuracy and eliminating ambiguities in the text. Safety managers used to spend at least 30% of their time on paper issues; now they spend less than half that on the administrative part of the process. In addition, it used to take as long as five hours to locate specific regulations. Now, with PC DOCS, any document can be found in less than five minutes.

DuPont safety managers used to spend at least 30% of their time on paper issues; now they spend less than 15% of their time on the administrative part of the process.

It used to take as long as five hours to locate specific regulations. Now, with PC DOCS it takes less than five minutes to locate any document.

These two PC DOCS case studies are excerpted from the ROI study Redefining Document Management, written by Scott McCready of IDC/Avanta Technology. For a free copy of the full report or for information on PC DOCS, call 800-933-3627 or visit our Web site at http://www.pcdocs.com

You never give your HP printer a second thought. You just know it's going to work. Now that same HP performance can be found in a line of PCs designed specifically for the demands of small business. The HP Vectra 500 PCs. They all arrive ready to work. Some are HP/Microsoft® Small Business Centers—they're armed with Microsoft Office for Windows®95 Professional Edition. And to make everything a little more manageable, every Vectra 500 comes with free online service and support. Dealers include: Intelligent Electronics, Computerland, Datago, MicroAge, Inacom and CompUSA Corporate. For more information, call 1-800-322-HPPC, Ext. 1547.[1] And see what a good family name can do for you.

intel inside pentium processor

Designed for Microsoft Windows 95

FROM $1,389*

Minitower or Desktop models:
- Intel 100, 120, 133, 150 or 166 MHz Pentium processor
- 8 or 16MB EDO Memory (128MB max)
- 256KB cache memory[2]
- 64-bit PCI video
- 2.5GB hard drive[3]
- 4X, 6X or 8X EIDE CD-ROM Drive[3]
- 28.8 fax/data modem with telephone answering machine[4]
- 16-bit Sound Blaster audio[4]
- Hands-free headset with microphone[4]
- 1-year on-site warranty[5]
- 1-year free phone support for hardware, 90-day free software support

[1]In Canada, call 1-800-387-3867. *Average U.S. street price for Pentium® processor-based HP Vectra 510 S/75 PC. Monitor not included. HP Vectra 500 PCs come with Microsoft Windows 95 preinstalled. [2]Standard on 133 and 166 MCx models, optional on all other models. [3]Other capacities available. [4]Standard on CD MC and MCx models. [5]Multimedia models only. [6]On-site second-day business service. Microsoft and Windows are U.S. registered trademarks of Microsoft Corporation. Pentium and the Intel Inside logo are registered trademarks of Intel Corporation. ©1996 Hewlett-Packard Company PP5428

HP PCs For Small Business

HEWLETT® PACKARD

HP and Microsoft: A relationship for the long term

Benefits to the customer of this type of relationship include confidence, ease of integration and migration, and support.

The relationship between Hewlett-Packard and Microsoft is a long-term working relationship that is focused on delivering better performance, ease of use and value to customers.

As the demand for easy interoperation overwhelms every other consideration in the PC world, it has become common for companies to develop partnerships aimed at solving specific problems or redressing specific technological shortcomings on both sides.

The relationship between Hewlett-Packard and Microsoft is different. It is neither a tactical agreement to address limited technical issues, nor a way to fill technological gaps. It is a long-term working relationship that is focused on delivering better performance, ease of use, and value to customers. Now more than 10 years old, this relationship has extended into almost every facet of each business: from development, through marketing and sales, to distribution and product support.

This kind of close interrelationship offers three benefits to the customer. First is confidence. Customers buying HP PCs and servers know that not only have those platforms been designed and optimized for Microsoft operating systems, drivers, tools, and utilities, they are also certified by Microsoft, thus ensuring that the customer has an excellent out-of-box experience with that system.

Second is ease of integration and migration. Hewlett-Packard understands Microsoft technology so well that HP can develop PCs to be up and running in Microsoft and Novell networking environments faster and more smoothly than anybody else. And if customers want to migrate to a 32-bit operating environment like Windows NT®, they can find PCs for all mainstream, advanced and expert users, and know that not only will the hardware platform be impeccably designed for that OS, it will also be supported by a support organization with global reach.

Support is the third major benefit resulting from HP and Microsoft's close cooperation. If you are an MIS manager concerned about support, HP and Microsoft make it possible for you to have essentially any option you want. You can do the support yourself, of course, or outsource it, or call HP for support of either the platform, or the system software, or both. HP has a support

organization trained in supporting Microsoft software, and its sales organization is licensed to sell Microsoft support as well.

Two examples of the HP/Microsoft synergy are found in the HP Vectra XW Personal Workstation and in HP JetAdmin for Windows 95. A workstation based on Windows NT and the Intel Pentium Pro processor, the HP Vectra XW is aimed at professionals in the growing scientific and design markets that have accepted Windows NT-based workstations. This expandable machine is configured with one or two 200MHz Pentium Pros, a 3D graphics accelerator with the OpenGL acceleration, and plenty of memory. All this power is available to engineering and design users who are ready for Windows NT and are looking for price/performance levels never seen before. It is made accessible through the Microsoft Windows NT OS and symmetric multiprocessor support.

JetAdmin for Windows 95 is an example of a different kind of synergy. This utility developed by Hewlett-Packard greatly simplifies the management of networked HP printing resources. It is usually supplied by Hewlett-Packard in a number of ways. In this case, however, Microsoft has decided to bundle JetAdmin with every copy of Windows 95 that they ship. This is a testament to the closeness of the strategic relationship between the two companies. Because if a person looks at Windows 95, they see a lot of Microsoft-developed software, but they generally don't see many OEM products running in there — except HP's JetAdmin.

Ahead of the curve

Other examples of the collaboration between HP and Microsoft include typical beta programs and extremely atypical marketing programs (such as cooperating on the launch of Windows 95/Success Express Tour), and sales programs that include everything from joint sales calls to a regular video-broadcast program designed to share time-critical information between the two sales forces. For the future, HP has made a significant commitment to the development of the Next-Generation Hardware Platform. The success of this effort will depend on how well the hardware and systems software and applications software work together. Customers want more power, but they don't want to sacrifice the applications productivity and stability they now enjoy.

Customers want more power, but they don't want to sacrifice the applications productivity and stability they now enjoy.

As the industry moves to this new platform, HP's close working relationship with Microsoft will help ensure that HP customers are well ahead of the curve in making this new generation of functionality an integral part of their systems environments.

HEWLETT® PACKARD

Folio. We're In Every Market You Play In.

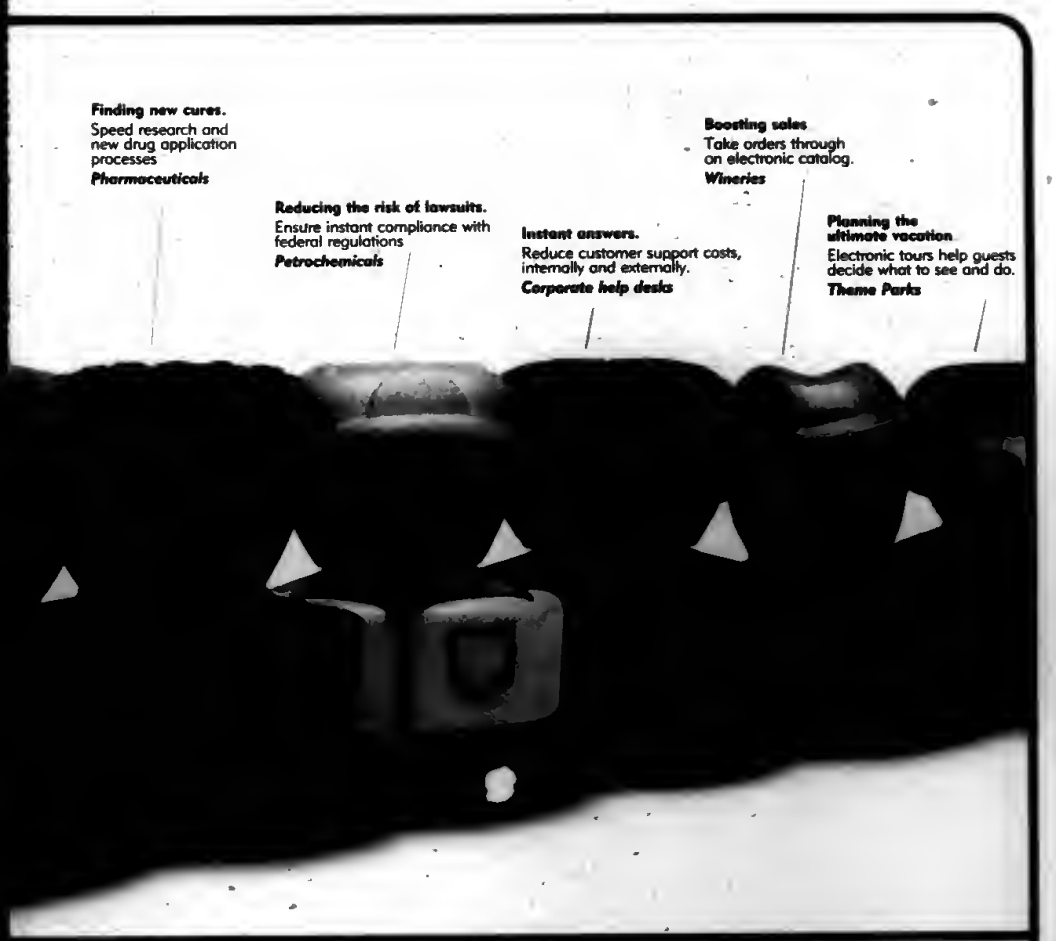
Saving millions of dollars and trees.
Eliminate printing of corporate manuals.
Insurance

Winning that big case.
Fast searching, linking and annotating of reference material
Legal

Maintaining consistent and accurate information.
Cost-effective data distribution and updating.
Financial

So, what's your game? Whether it's banking, law, pharmaceuticals—even vintage wines—you'll be happy to know Folio is a player. That's because each of these fields and more face common challenges—information publishing, distribution, and updating. And the stakes are huge. Just about everything a business does these days depends on getting information into the right hands.

That's why having Folio on your team is a smart move. Folio solutions give professionals the simplest way to take information from any source, compile it into an easily searchable format, then



distribute it anywhere. Automatically.

That means a level of power and flexibility that makes other so-called "solutions" look like child's play. Which explains why Folio is the information publishing choice of corporations worldwide, with over 30 million people tapping the power of Folio solutions to improve the quality of their work.

To find out how Folio can help you get a firm handle on your information publishing needs, and your market, call 800.543.6546 for more information and a Folio Partner near you.

For more information on Folio Products and a Folio Partner near you, visit www.folio.com • Phone: (800) 543-6546 or (801) 229-6710

FOLIO.

Software Spectrum teams with Microsoft to help firms making transition to Exchange

Workshops help users with the planning necessary to minimize interruption of critical communications applications.

Software Spectrum is working with Microsoft Consulting Services (MCS) to offer workshops on Microsoft Exchange Server. The three-day workshops are designed for IT managers and staff from companies preparing to move to Exchange, and include Technical Solution Briefings on Exchange Server technology and its potential.

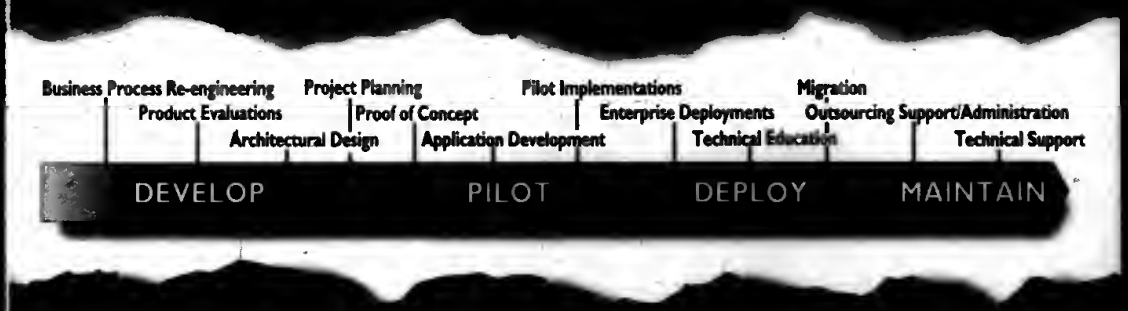
Exchange Server, a global messaging solution with built-in groupware and application development tools, "lets businesses combine all e-mail, groupware and Internet connectivity on a single PC platform," says Software Spectrum Technology Services Group president Link Simpson. "The result is seamless messaging worldwide."

But, he adds, "This robust server solution requires comprehensive planning to minimize the interruption of critical communications applications." This is why TSG and MCS have developed a methodology to shorten the Exchange Server implementation process. The workshops include three days of analysis of individual corporate needs, how-to discussions on installation and deployment, plus development of site plans, domain structure and cost modeling.

Steve Lewis, director of information systems for Fried, Frank, Harris, Schriver and Jacobson, a Manhattan-based law firm planning 1,400 seats of Exchange Server, took part in a pilot workshop this summer. "It was very helpful," he says. "It set our expectations more realistically in terms of what we'd have to do to lay the groundwork and clean up our current domain structure."

"It set our expectations more realistically in terms of what we'd have to do to lay the groundwork."

Headquartered in Garland, Texas, Software Spectrum provides customers with a variety of business software products and software licensing services, and assists them in the implementation, deployment and support of their computing strategies. Its workshops, which are limited to 10 attendees, are held at TSG's 12 locations: Atlanta, Chicago, Dallas, Detroit, Denver, Houston, Los Angeles, Minneapolis, New York, San Francisco, Seattle and Toronto. Price is $2500 per participant or $4000 for two people from the same organization. To register, call TSG at (500) 624-2033.



SOLUTION PROVIDER

SOLUTION PROVIDER

FileNet and Microsoft — together, they're making it easier to manage documents

With more organizations moving to NT, FileNet Corp. is positioned to provide them with a suite of products to leverage their investments.

Microsoft and FileNet are making it easier for users to manage documents stored anywhere across the enterprise. The two companies have announced a relationship that includes product development, marketing, support and service initiatives, giving business decision makers and IT managers greater access to a range of Microsoft platform-based products from FileNet.

FileNet has the largest installed base of enterprise document management solutions on the Windows NT Server platform.

The move makes sense. FileNet has the largest installed base of enterprise document management solutions – some 2,500 systems – on the Windows NTe Server platform. As more and more organizations move to Windows NT, FileNet is positioned to provide them with a suite of workflow, document imaging, document management and COLD (Computer Output to Laser Disk) products to leverage their investments.

These products comprise FileNet's "Foundation for Enterprise Document Management" and enable organizations to manage information in any form, including text, scanned images, faxes, spreadsheets and video, says Ted Smith, FileNet President and CEO. "It makes the information available anywhere in an organization, including via intranet and Internet applications."

"Our enterprise relationship with FileNet is a reflection of Microsoft's commitment to partner with the leading companies in their respective fields," says Jeff Raikes, Group Vice President of Sales and Marketing at Microsoft. "FileNet brings to this relationship a targeted market focus and an extensive solution suite for managing, accessing and sharing all information across the enterprise. The company also has a strong Windows NT focus, and a large customer and reseller base that makes it an excellent long-term partner for Microsoft."

FileNet is also offering a seminar series – In Focus – that will be conducted in cities across North America through 1996. For more information, call 1-800-FILENET (345-3638) or 714-966-3400, or visit our web site at http://www.filenet.com. For the seminar nearest you, see the registration certificate on the next page, or call 1-800-544-8456 to register.

Microsoft, FileNet and You—

Together, We Can Build a "Foundation for Enterprise Document Management"™

FileNet invites you to attend a FREE seminar co-sponsored by Compaq ...coming soon to a location near you!

FileNet

IN FOCUS *Executive Forum*

"Enterprise Document Management on the World Wide Web" is the topic of this fast-paced seminar, conducted by FileNet executives at 12 cities throughout North America. The half-day seminar is ideal for business decision makers and IT managers.
8:30 a.m. – noon.

Brought To You By FileNet—Helping You Put Documents to Work

FileNet Corporation, including its Saros® and Watermark® products, provides a "Foundation for Enterprise Document Management" to improve productivity. FileNet's® family of products manages unstructured information—paper documents, faxes and electronic documents—for a variety of work environments. Ranked as the 34th largest independent software vendor worldwide by *Software Magazine*, FileNet's products are sold in 60 countries through its sales and support organization as well as its ValueNet® Partner Program of resellers, system integrators and application developers.

Call toll-free or clip and fax the coupon today to sign up for the FREE seminar of your choice!

1-800-544-8456

3565 Harbor Blvd.,
Costa Mesa, California 92626-1420
http://www.filenet.com

FileNet

FileNet, Saros, Watermark, and ValueNet are registered trademarks of FileNet Corp. ©1996, FileNet Corporation

SIGN UP TODAY FOR A FREE SEMINAR

FAX this coupon today to reserve your place at the FileNet seminar of your choice. You'll receive a confirmation notice, directions and complete details via FAX or e-mail. Space is limited, so register today!

☐ ***YES*** – I'M INTERESTED IN ATTENDING THE FREE SEMINAR IN THE CITY I'VE CHECKED.

Name_____

Title_____

Company _____

Address _____

City/State/Zip _____

Telephone_____ FAX_____ E-mail _____

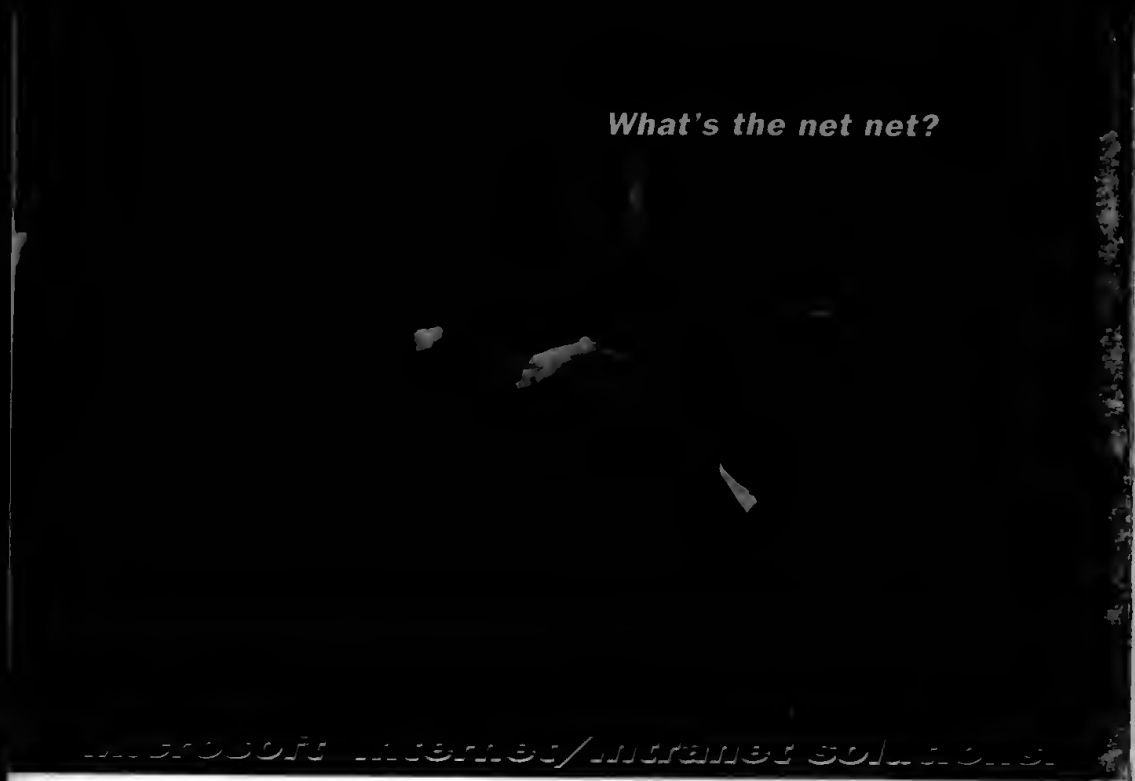
Please check the seminar you would like to attend:

FileNet Seminar Locations

☐ Atlanta	☐ Irvine
☐ Boston	☐ Minneapolis
☐ Denver	☐ Philadelphia
☐ Detroit	☐ San Francisco
☐ Houston	☐ St. Louis
☐ Indianapolis	☐ Toronto

INF0002

FAX to 512-244-9222



Microsoft Internet/Intranet Solutions

Come to a free, half-day briefing and find out how the right solutions can help your company work smarter—and more profitably.

As you know all too well, talk is cheap, but technology isn't. That's why we're cutting through all the chatter to provide you with a strategic overview of new technologies which can help keep information, work and profits all moving together.

You'll get an inside look at Microsoft technologies for today and tomorrow, including highlights of the latest Internet/Intranet developments and how they're incorporated in many of our products. You'll observe the latest Microsoft-based solutions for taking advantage of Internet business opportunities, maximizing the benefit from communication-enabled line-of-business applications, enhancing team collaboration with a company Intranet, and more. You'll see first-hand how Microsoft Solution Providers are uniquely qualified to provide you with solutions at an unprecedented level of functionality. And you'll have a chance to sign up with a Solution Provider to conduct a customized evaluation of Microsoft Internet and Intranet products, the latest version of Microsoft Office, Windows® 95, BackOffice™, and development tools.

If you're a business decision maker or information technology professional in an organization with 100 or more employees, and you need to use technology to accomplish business objectives, this briefing is for you.

Call (800) 836-8282, Dept. A779 today to get information about a briefing near you.

©1996 Microsoft Corporation. All rights reserved. This document is provided for informational purposes only. MICROSOFT MAKES NO WARRANTIES, EXPRESS OR IMPLIED, IN THIS SUMMARY. Microsoft and Windows are registered trademarks and BackOffice and Where do you want to go today? are trademarks of Microsoft Corporation.

Publication Partner
COMPUTERWORLD
The Newspaper of Information Systems Management

Microsoft
WHERE DO YOU WANT TO GO TODAY?

Bruce Hoard

A Microsoft-centric walk down memory lane

History takes a backseat to electronic revisionism in the age of cyber-publishing.

Staring dully at my PR Newswire summary recently, one headline stood out: "Microsoft Corp. apologizes to South Korea for erroneously suggesting in its latest CD-ROM encyclopedia that part of ancient Korea was ruled by Japan."

Evidently, some sharp-eyed history buffs in modern South Korea tore themselves away from the spectacle of that country's ex-presidents being flagellated long enough to electronically thumb their way through The Electronic Book of Gates. And guess what? They claim to have found a big old boo-boo.

How can that kind of thing occur? Aren't we talking about factual information here? I mean, Japan either did or did not rule part of ancient Korea, right? It isn't as if the Microsoft CD-ROM encyclopedia said, "Part of ancient Korea was ruled by Snoop Doggy Dog," or, "Bungee-jumping first originated in part of ancient Korea."

MS in history

You would think folks at Microsoft would know better. But if they could screw up on basic ancient Korean history, maybe they would try to pass off other revisionist information. I can see the Microsoft CD-ROM encyclopedia headlines now: "Netscape Navigator failed Vasco de Gama as he rounded Cape of Good Hope" and "Windows NT slashed pyramid construction time from 500 years to eight days."

The busy little worker bees editing the Microsoft CD-ROM encyclopedia could be kept up late concocting Microsoft-centric facts, such as "Ancient Redmond conquered Great Armonkian Empire" and "Explorer 3.0 completes first non-snowmobile trek to North Pole."

The potential for disinformation free fall is ominous, regardless of the source. These days, anybody with a World Wide Web page and a little imagination can publish any message he wants to an audience of millions. America Online boss Steve Case has a more-than-ample platform to plead his case: "Mass modem failure locks out users from up-and-running AOL." How about the IRS? It could set matters straight by proclaiming, "Dog steals computer printouts; billions of dollars lost."

Novell, which is a little bit embarrassed about snoozing through the Internet era, can now reveal what only it has previously known: "Novell constructs Great Firewall of China." Here's another significant computer industry fact that may finally get out: "American Federation of Information Processing Societies holds first National Computer Conference in Machu Pichu Convention Center; oxcart shuttles clog major throughways."

As it turns out, the Great Database and Visual Programming Wars of the 20th century may actually date to ancient Greece. The following headline is likely to emerge from the archives of a well-known vendor: "Oracle of Delphi condemns object infidels to fiery deaths."

There's certainly no reason politicians shouldn't cash in on electronic revisionism. Beleaguered Clinton spin doctors can get their word out on the Bill Clinton home page (xxx.billbull), and Bob Dole can counter with his own site (dole.dolt.dull). But keeping up with the revisionist updates at those Web sites would require that they run as screen savers channel-attached to massively parallel systems.

Clearly, the truth ain't what it used to be.

Hoard maintains that the light reflected on his head in the photo at left is actually a tractor beam pulling him toward a subspace rift. At least for now, he can be reached at bruceh6687@aol.com.

Patricia B. Seybold

How to turn Web hits into home runs

Some Web sites have gone beyond lip service and provide real customer service.

Lots of companies say they offer customer service on their World Wide Web sites. Few really do. In fact, we're all so starved for good customer service that we tend to notice when we're treated well. We quickly become raving fans when somebody surprises us by treating us well.

One of my favorite Web sites is Amazon (www.amazon.com), the best virtual bookstore on the Web. Every detail of the site was carefully designed to speed you through the process of browsing and ordering books. The search engine is precise. The ordering process is efficient and reassuring. Confirmation is quick. Notifications are accurate and friendly ("We found the book you were looking for…").

Moreover, delivery is prompt, and the service is personal. My orders are carefully wrapped and accompanied by handwritten notes that explain any discrepancies (such as, "You ordered the paperback, but we only had the hardcover in stock, so we're sending it to you at the same price"). Now I'm a raving fan of the Amazon site — even though I've never communicated with an actual person at Amazon.

Another good example is the National Semiconductor site (www.nsc.com). Now, I don't buy a lot of chips, but if I did, I think I'd like doing business with National Semiconductor over the Web. A design engineer can use the company's parametric search engine to find the components that meet his specs, get pricing information and even download detailed drawings.

Or take a look at a small business that keeps its customers and prospects in mind. A&a Printers (www.aaprint.com) in Menlo Park, Calif., lets customers see which press times are available, check the status of their print jobs and get price estimates and delivery schedules online.

But that's not all. This Web site provides some nifty tools for publication designers, such as a spine width calculator. You tell it what cover stock and paper you're using and the number of pages, and it will tell you how thick the spine will be so you know what artwork will fit. A&a's Web site also supports the virtual teams that are often involved in preparing marketing materials for production. The designer, layout person, editor and production manager can all interact with the production supervisor and make last-minute decisions on the fly.

There's still a lot of bad customer service on the Web — and not just the useless graphics that take too long to download. Sometimes there are glitches in execution, such as when you double-click on the "order" icon and get shipped two copies of the same document. Or your order disappears into cyberspace without showing you what you purchased and giving you a chance to confirm or change your mind.

Some lapses in customer service are intentional. At United Airlines' Web site, you still can't find out when a particular plane will land, so you have to call a toll-free number for flight arrival and departure times. United has decided that most customers prefer to use the telephone to check for real-time information.

Limited choices

And there are many sites that don't allow would-be customers to transact business because the owners don't think customers trust Internet security. They think they're protecting their customers. Actually, they're insulting them by denying them the choice of either a secure Web transaction or a more traditional mode (such as phone or fax).

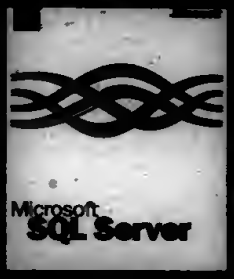
Take a fresh look at your Web site. How does it treat your customers? Does it anticipate their needs and make it easy to interact with your company? Does it support the entire business transaction?

If you suspect your Web presence is deficient in this area, you're probably right. It's time to get your customer service department involved with Web site development.

Seybold is president of Patricia Seybold Group in Boston. Her Internet address is pseybold@pgroup.com.

It takes lots of money and manpower to keep information systems running.

Or so our competitors would have you think.



Download a free* 120-day evaluation copy of SQL Server 6.5 from the Web today.

Memo to Lou: Buy Netscape

To: IBM Chairman Lou Gerstner

In a recent speech, you told stockholders: "Two years ago, we talked about stability. Last year: growth. Now, we are gunning for leadership."

But there can be only one industry leader. Today, it is Microsoft. The only way IBM can change that is to buy Netscape — and the sooner, the better.

Face it. The Lotus and Tivoli acquisitions are fine, but your in-house software efforts — OS/2, AIX, the Internet Connection Server, and CICS and DB2 for server systems — are taking you nowhere

Then there's Netscape, facing Microsoft's withering assault. Microsoft will give away its Internet products for as long as necessary to cripple its last real rival. Maybe it will falter or the government will intervene, but can you take that chance?

Consider the consequences if Netscape goes down and Microsoft controls PC operating systems, PC applications, Web browsers, Web servers and the enterprise operating system with Windows NT. Outside of the data center, IBM will be nothing more than a follower.

You know you can afford it, even if Netscape resists. As of your June quarter, IBM had $6.4 billion in cash. Netscape's current market capitalization is roughly $3.8 billion. Even if the deal costs $5 billion, it's a small bet to restore much of IBM's lost status. Netscape might resist a lot less than you might think. It's clearly feeling the heat.

Think of what the deal could do for your customers. You would be the industry leader in browsers, Web servers, groupware and enterprise computing systems and services. You could afford to let OS/2 fade away and wholeheartedly support both Unix and NT. This might even end the silly operating systems wars, much to the joy of your customers and your PowerPC group. Linking the Internet with mission-critical legacy systems is becoming a critical business requirement. IBM's position here would be overwhelming.

Consider the marketing benefits. Our research shows that only 2% of business customers think of IBM first when they think of the Internet, whereas 33% think of Netscape.

At a more personal level, Jim Barksdale, with his background at Federal Express, would make a great IBM employee and customer advocate in a way that Jim Manzi never could.

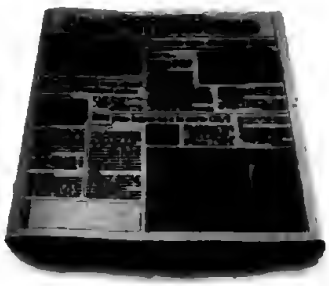
Sure, there would be internal tensions, especially between Netscape and Lotus. In areas such as groupware and directories, some tough decisions will have to be made. But if you locked Ray Ozzie, Marc Andreessen, Irving Wladawsky-Berger and the best brains from Tivoli in a room with a dozen of your smartest customers, you could begin to make network-centric enterprise computing a reality. Even Microsoft would have to take notice.

IBM likes to see itself as the world's largest software company. With Netscape, Lotus and Tivoli, it could also be the world's best. If you are serious about "gunning" for industry leadership, you should pull the trigger now. It may be your last chance for a very long time.

David Moschella

Counter Microsoft by adding Netscape to the Lotus and Tivoli stew.

Moschella is senior vice president of research at Computerworld, Inc. in Framingham, Mass.



IT'S NOT HOW MUCH YOU READ.

You can read a knee-high stack of computer magazines each month and still not find the depth and breadth of news and information you'll discover each week in the pages of *Computerworld*.

As the only weekly newspaper for IS professionals, *Computerworld* is filled with up-to-the-minute articles on topics ranging from products and people to trends and technology. We cover it all — PC's, workstations, mainframes, client/server computing, networking, communications, open systems, languages, industry news, and more.

It's everything you need to know to get an edge on the competition.

That's why over 145,000 IS professionals pay to subscribe to *Computerworld*. Shouldn't you?

IT'S WHAT YOU READ.

Order *Computerworld* and you'll receive 51 information-packed issues. Plus, you'll receive our special bonus publication, *The Premier 100*, an annual profile of the leading companies using information systems technology.

Call us toll-free at **1-800-343-6474**, or visit us on the World Wide Web at http://www.computerworld.com. To order by mail, use the postage-paid subscription card bound into this issue. And get your own copy of *Computerworld*.

Then you can spend less time reading about the world of information systems. And more time conquering it.

COMPUTERWORLD

Everything you need to know.

THERE'S ONLY ONE PROBLEM WITH BUYING
A PC DESIGNED FOR TODAY'S BUSINESS APPLICATIONS.
IT'S CALLED TOMORROW.

intel inside
PENTIUM PRO

Intel Pentium Pro Processor up to 200 MHz

16 MB or 32 MB RAM Standard

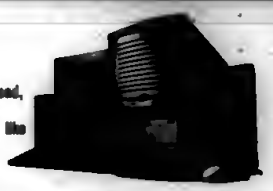
2 GB IDE or SCSI hard drive

PCI Accelerated 2D and 3D graphics

Microsoft Windows NT

3 year limited warranty

INTRODUCING THE POWERMATE PROFESSIONAL SERIES WITH PENTIUM® PRO PROCESSOR.



These days, trying to buy technology for your company is like trying to shoot a moving target. If you don't set your sights far enough ahead, you'll miss. Fortunately, the NEC PowerMate® Professional is at the leading edge of the technology curve. With advanced technologies like a 200 MHz Intel Pentium Pro processor and Microsoft Windows NT®, the PowerMate Professional is just the long-term investment your company has been looking for. Power hungry 32-bit office applications, like 3D CAD/CAM and financial modeling, are not a problem for the PowerMate Professional system. And you can maintain full compatibility with all general purpose PC applications. So if you're tired of keeping up with the latest technology, we have a solution: the latest technology. For more information on the PowerMate Professional Series and other PowerMate products, just call 1-800-NEC-INFO, or visit us on the web at http://www.nec.com.

SEE, HEAR AND FEEL THE DIFFERENCE.™

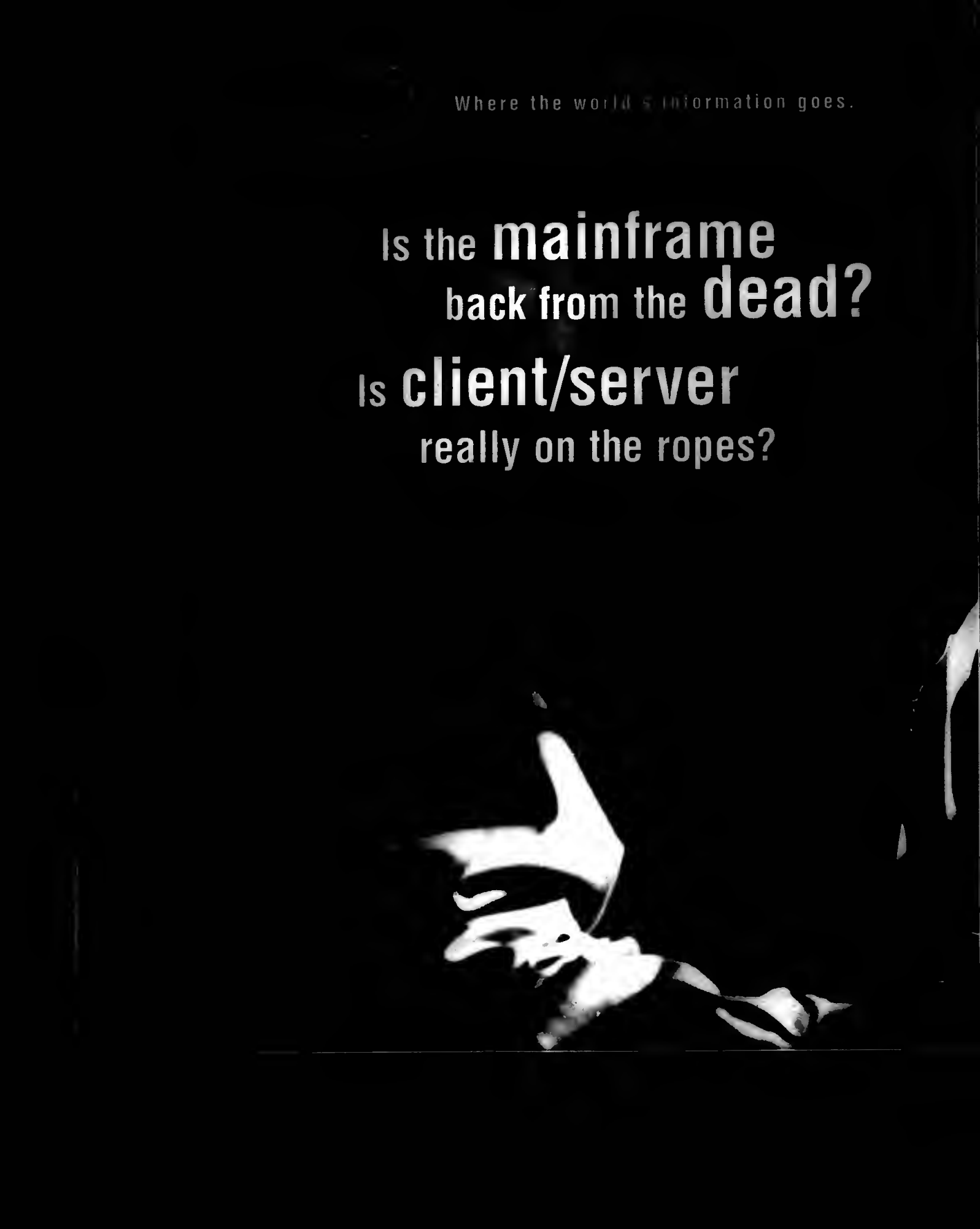
NEC

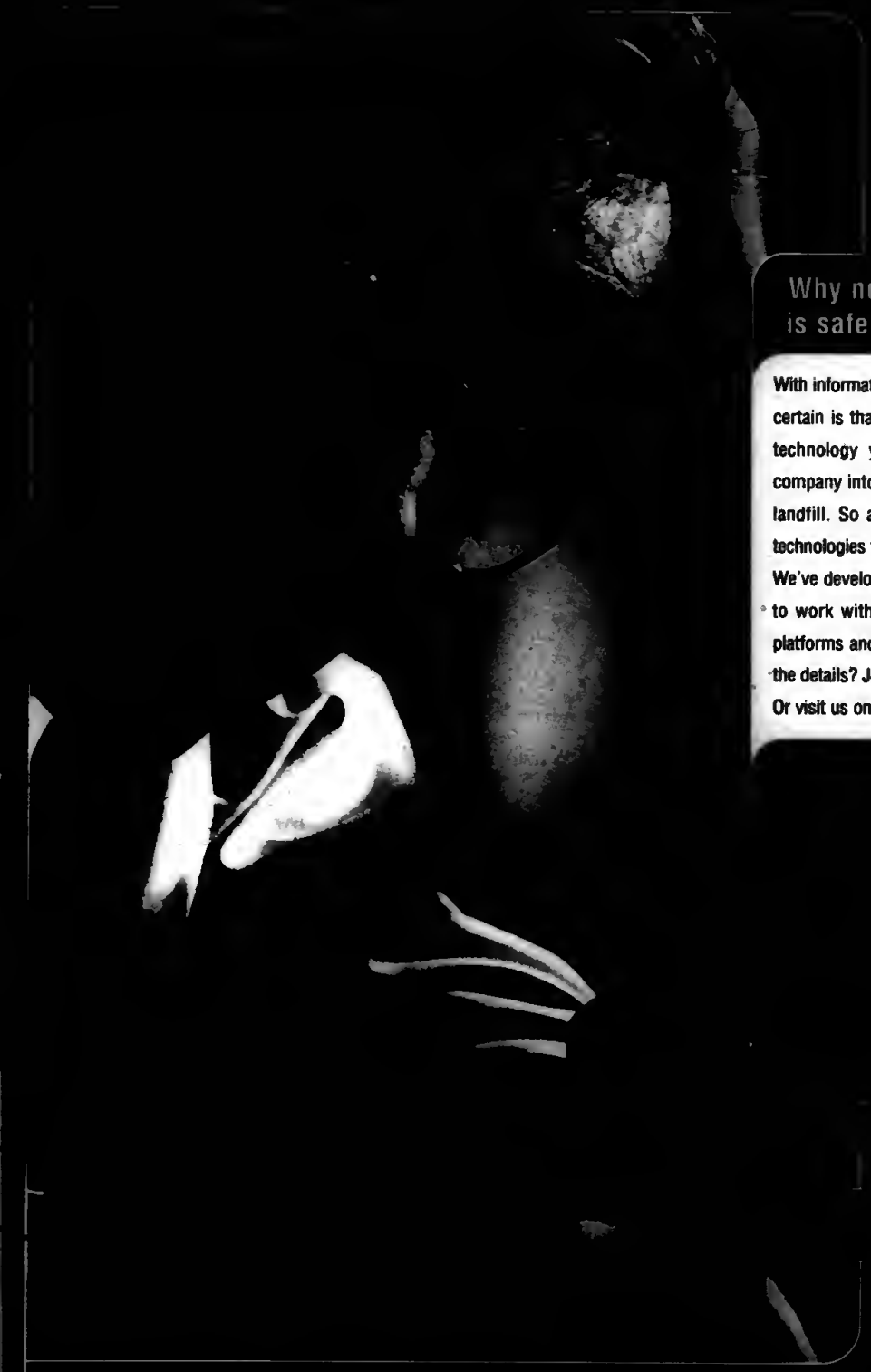
© 1996 Packard Bell NEC, Inc. NEC and PowerMate are registered trademarks of NEC Corporation. See, Hear and Feel the Difference is a registered trademark of NEC Technologies, Inc. The Intel Inside logo/Intel Pentium are registered trademarks and the Pentium Processor logo and the Pentium Pro Processor logo are trademarks of Intel Corporation. Microsoft, Windows and Windows NT are registered trademarks of Microsoft Corporation.

Where the world's information goes.

Is the mainframe back from the dead?

Is client/server really on the ropes?





Why not be sure your data is safe whatever happens?

With information technology, the only thing that's certain is that everything will change. The next technology you commit to could lead your company into the future. Or it could wind up as landfill. So at StorageTek,® we design flexible technologies that let you keep your options open. We've developed a full line of storage solutions to work with different architectures, different platforms and different kinds of networks. Want the details? Just call **1 800 922-3260, ext. 1401.** Or visit us on the Web. Either way, we're flexible.

Three more reasons to choose PowerPC technology.

for Windows NT, StarMax for Mac OS and PowerStack II for AIX

As if you needed any more reasons to choose PowerPC™ architecture, Motorola has launched an entire line of desktops, workstations and servers running on PowerPC technology, including systems for Mac® OS, Windows NT® and AIX®. So there are even more systems out there with the definite advantage of PowerPC performance. In fact, recent BYTE *magazine tests proved that the PowerPC 603e™ and 604e™ microprocessors outperformed the Pentium® and Pentium® Pro, respectively.† Which is another good reason. And both the scalable design and technology road map of PowerPC architecture mean you'll have wider ranges of performance, power consumption and flexibility for years to come. Call 1-800-759-1107, ext. CW, or visit http://www.mot.com/computer/ to find out about PowerPC systems from Motorola and even more reasons to choose them.*

MOTOROLA

©1996 Motorola, Inc. All rights reserved. Motorola and Ⓜ are registered trademarks and PowerStack and StarMax are trademarks of Motorola, Inc. PowerPC 603e, PowerPC 604e, PowerPC and the PowerPC logo are trademarks of and are used under license from International Business Machines Corporation. All other brand and product names are the trademarks or registered trademarks of their respective holders. †August, 1996

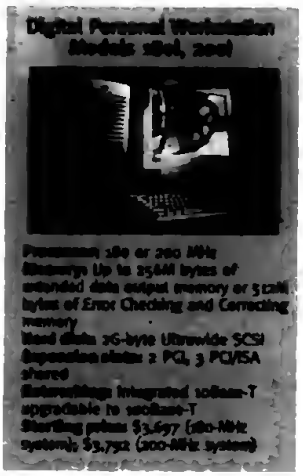
What you never thought possible.™

Digital pumps up its NT workstations

By Jaikumar Vijayan

The stream of Windows NT personal workstations that analysts expected would follow the rollout of NT 4.0 is gathering force.

Digital Equipment Corp., for instance, last week extended its lineup of such workstations with the introduction of models based on Intel Corp.'s 180- and 200-MHz Pentium Pro chips. The new systems join Digital's lineup of Pentium- and Alpha processor-based Windows NT Personal Workstations.



Faster I/O

The systems feature symmetrical multiprocessor support, faster I/O than existing models and three-dimensional workstation Powerstorm Graphics capabilities. Digital has migrated the 3-D capabilities from its Unix technical workstations. The new workstations come with Windows NT 3.51 or 4.0 installed. They support between 32M bytes and 256M bytes of memory, a 2G-byte hard drive and Ultrawide SCSI.

The 180i and 200i models also include eight-speed CD-ROM drives, built-in Ethernet support, 16-bit audio, a range of 3-D workstation graphics and the option of upgrading to higher-speed Pentium Pro and Alpha chips. A fully configured system based on the 200-MHz Pentium Pro starts at $5,372.

Personal workstations are an emerg-

Digital, *page 44*

More choices for mobile device users

By Mindy Blodgett

Mobile professionals seeking faster laptops and handheld computers with wireless capabilities now have more to choose from.

Dell Computer Corp. in Austin, Texas, and Fujitsu Personal Systems, Inc. in Santa Clara, Calif., announced offerings this week. And Sharp Electronics Corp. in Mahwah, N.J., recently launched a "wide-screen format" computer line.

Fierce competition

The announcements show how vendors are vying for attention in a crowded, competitive mobile market, according to Nathan Nuttle, an analyst at Sherwood Research, Inc. in Wellesley, Mass.

Nuttle said midlevel and lower-tier vendors such as Dell and Sharp can take advantage of serious backlog problems at high-end computer makers, including Toshiba America Information Systems, Inc. and IBM PC Co.

"The bigger makers have been having problems meeting demand, and a company like Dell, which builds to order, can do well in a market like that," Nuttle said.

Many vendors have had problems because of a slowdown in laptop screen production by Asian makers. But Sharp makes its own screens, Nuttle said.

Fujitsu has also introduced to the handheld PC market a "tablet" computer that has wireless connection capabilities.

Christopher Guidette, a spokesman for Insurance Services Offices, Inc. in New York, said 500 field service representatives and others use the Fujitsu Stylistic RF tablet computers, but without the wireless access feature.

"The devices are lightweight and easy to use and meet our needs in doing insurance surveys," Guidette said. The com-

Mobile, *page 44*

AS/400 server passes the bar

By Michael Goldberg
SAN FRANCISCO

In California, the only sure way to know if your lawyer is legitimate is to telephone or write the state bar association.

But starting next week, anyone using a Web browser can determine the standing of any attorney in the state.

In the past year, the State Bar of California has looked to the World Wide Web as a way to improve communications with its 120,000 members and the public, said the group's president, James Towery, a partner at the San Jose law firm of Hoge, Fenton, Jones & Appel.

Web servers

The state bar's site (www.calbar.org) now provides consumer information about finding a lawyer and invites public comment on pending state legislation that relates to the legal profession. But that is only the beginning, officials said.

The bar hopes to include information on continuing education, online forums on legal issues and information about disciplined lawyers. In November, the state bar will post bar exam results 48 hours early — to be viewed by applicants with passwords.

The California bar's work puts it ahead of other lawyers' groups working with the Internet, said David Hambourger, director of the American Bar Association's legal technology resource center in Chicago. "California's plans seem to be a perfect application of the technology, if it's done correctly," he said.

The state bar, which has 750 employees and 18 information systems staffers, operates in San Francisco and Los Angeles. It runs two AS/400 servers linked by T1 communications lines that use the SNA networking protocol.

Computer services director David Jones said the first decision made last year was to proceed cautiously. Instead of heeding calls to install a Sun Microsystems, Inc. server, he outsourced the hosting of the state bar's Web home page to USA.Net, Inc. in Colorado Springs.

That way, Jones said, his staff could gain in-house knowledge on how to develop Web applications for the familiar AS/400 without hiring a Unix professional for a Sun server. Now the office uses a

Bar, *page 42*

State bar looks to the Web

CONTINUED FROM PAGE 41

software package from I/Net, Inc. to test its conversion of database records into HyperText Markup Language for viewing on the Web.

"We wanted [to handle our Web applications] so that management of that system was not a major new function" for our staff, Jones said. "In the long run, part of our thinking is we'll bring the home page in-house here, too."

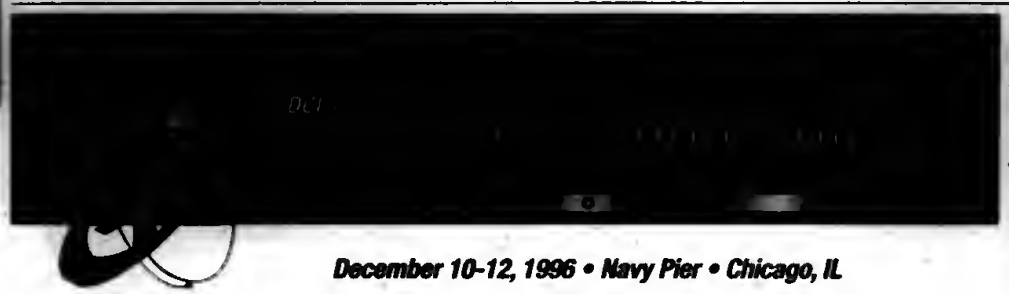
Jones assigned two programmers to develop the database-to-Web application that will let browsers search the state bar's membership list. That database, housed in a new AS/400, will have an automatic link to the California bar's home page.

200,000 calls each year

The membership list is a key function. The bar office pays workers to answer an estimated 200,000 calls per year to verify that lawyers are bar members fit to practice in the state. Cutting down on that time would save money, Towery said.

"We haven't used interactivity yet, but that is one of the goals. The potential there for discussion groups among lawyers" is great, Towery said.

The AS/400 cost approximately $34,000 for a model that will handle the current in-house Web applications and more in the future. That is less than the cost of bringing in a new Unix server and learning new skills, Jones said.



December 10-12, 1996 • Navy Pier • Chicago, IL

Invest Your Time Where You'll Get The Greatest Return

For your enterprise to stay competitive in today's marketplace it is critical for you to stay current with today's rapidly evolving technologies. DCI's Database & Client/Server World is the only conference that brings you over 200 industry gurus with insights on products, vendors and trends *YOU* need to know about. This event is the gathering place for the largest exposition and showcase of application development, document management, warehousing, client/server, Internet and Intranet tools ever staged. The information presented at this event could impact your strategic decisions.

THE GREAT DEBATES

Has The Internet Killed Client/Server?

Wednesday, 10:30 a.m.

This lively debate features leading industry architects along with key analysts who will argue the future of network and client/server based computing.

Object-Relational Database Issues

Thursday, 9:30 a.m.

We've brought the top data architects from the leading DBMS vendors together to show you their strategies for interfacing object-oriented programming languages with relational DBMSs. From this group of industry leaders you'll get a glimpse into the future of database management and client/server computing.

REGISTER TODAY! CALL (508) 470-3880

The Complete Conference Brochure Can Be Found on the World-Wide Web at http://www.dciexpo.com

24 Hour Fax Line: (508) 470-0526 • Phone: 508-470-3880 • E-Mail: Conflag@dciexpo.com

☐ Please send me the complete Database & Client/Server World Conference Brochure (5491)
☐ Please register me for the FREE Exposition (5492)
☐ Please send me information on how my company may exhibit

Name _____ Title _____
Company _____
Street _____ Mail Stop _____
City _____ State _____ Zip _____
Telephone _____ Fax _____ Email Address _____

PIAWC98

New Products

The Linksys Group, Inc. has announced a slimline series of 5-, 10- and 20-port workgroup hubs.

According to the Dana Point, Calif., company, the three hubs are fully compatible with most major network operating systems and can be used to share hard drives, files, printers and multimedia between PC or Macintosh users. Pricing starts at $69.99.

▶ *Linksys Group*
(714) 261-1288
www.linksys.com

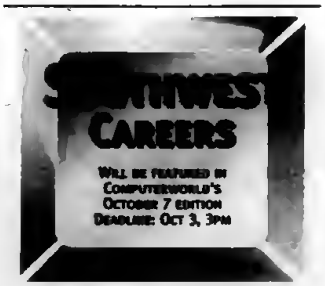
Hewlett-Packard Co. has announced the HP DeskJet 1600CN color printer.

According to the Palo Alto, Calif., company, the new printer was designed for users who don't need extra memory or PostScript — features in the DeskJet 1600CM, which was released in 1995. The 1600CN includes an additional paper tray for a total input capacity of 680 sheets. Pricing for the HP DeskJet 1600CN starts at about $1,699.

▶ *Hewlett-Packard*
(415) 857-1501
www.hp.com

Boffin Ltd. has released JB828, an eight-speed CD-ROM jukebox to move 28 disks among seven eight-speed readers. According to the Burnsville, Minn., company, the new disk-to-reader ratio permits a swap time of less than two seconds per disk. Pricing starts at $4,999.

▶ *Boffin*
(612) 894-0595
www.boffin.com



THE BUILDERS

"EVERYBODY'S WEB SURFIN' THE WebFOCUS WAY.

Sing to Tune of *"Surfin' USA"*

If everybody had WebFOCUS
Across the USA
Then everybody'd do reporting
The WebFOCUS WAY

They could access any data
In the Enterprise
Styled reports on their browsers
Before their very eyes

Don't have to know FOCUS
Or even S-Q-L
Transforms your answers
To H-T-M-L

Aggregation on server
Thin clients here to stay
Better order WebFOCUS
Call THE BUILDERS Today

Information Builders
Web Ready Technology

http://www.ibi.com
800-969-INFO
In Canada Call 416-364-2760

Information Builders

FOCUS and WebFOCUS are trademarks of Information Builders, Inc., NY, NY 212-736-4433 E-mail: info@ibi.com

Digital NT workstations

CONTINUED FROM PAGE 41

ing class of technical systems based on highly standardized components and PC architecture. They are aimed at the engineering, mechanical design, 3-D animation, geographic information systems and scientific applications markets.

Predominantly based on Intel architecture, the systems offer a level of graphics and technical computing ability previously associated only with the Unix workstation space — but at far lower cost. An entry-level Digital workstation, based on the 200-MHz Pentium Pro chip, costs less than $4,000. Unix systems — although more powerful and supported by more applications — start at thousands of dollars more (CW, Aug. 26).

"We were favorably impressed with the systems," said Frank Foster, vice president of multimedia at Sony Pictures Imageworks in Culver City, Calif. Foster was an early user of Digital's dual-processor 200-MHz Pentium Pro-based Personal Workstation.

Sony Pictures Imageworks is a special effects company that has used Digital PCs to create effects for movies such as *Speed* and *Johnny Mnemonic*.

Maynard, Mass.-based Digital was among the first to announce NT-based workstations last September and has recently been joined by several other vendors. The most recent is Hewlett-Packard Co., which announced similar systems earlier this month. Desktop market leader Compaq Computer Corp. is waiting in the wings to announce its personal workstation lineup this fall.

"What Digital is doing is good stuff, and they have a great market with these products," said Terry Shannon, editor of "Shannon Knows DEC," a newsletter in Ashland, Mass.

"But watch this space. A lot of others are on the verge of doing similar products," he said.

COMPUTERWORLD

CUSTOM PUBLICATIONS

A well-established media solution used by leading IT marketers

Since 1990 Computerworld Custom Publications has been the custom print choice for market leaders such as Microsoft, Hewlett-Packard, Oracle, Informix and Sun Microsystems. Having produced over 100 White Papers and custom supplements, the Computerworld Custom Publications staff provides media solutions.

High readership among a premier IS audience

High readership scores from recent Roper Starch studies demonstrate the added effectiveness of placing your custom publication in Computerworld. These studies listed custom publication advertising among the "Top 10 ads by Read Most/Noted Ratio."

Turnkey programs provided by an expert staff

Our in-house custom publication staff serves as your marketing partner in the planning, design and production of your custom publication—for insertion in Computerworld and/or other delivery vehicles you specify.

Communicate your custom technology solution using the brand the IT

Your technology solution delivered by the brand IS trusts

Fujitsu Stylistic 1000 RF

- Windows 95-compatible
- Built-in 2.4-GHz wireless LAN radio from Proxim
- Weighs 3.6 pounds
- 100-MHz 486 processor
- 8M bytes of memory

Mobile devices

CONTINUED FROM PAGE 41

pany isn't interested in wireless access, but might consider it in the future, he said.

Here are features of the recent device announcements:

- The Fujitsu Stylistic 1000 RF with wireless technology from Proxim, Inc. in Mountain View, Calif., weighs 3.6 pounds, has an Intel 486 processor and works with Windows 95. The tablet uses handwriting recognition technology, and a keyboard can be called up on the screen to be used by pointing and clicking. The device will cost between $4,185 and $4,830.
- The Dell Latitude XPi has been upgraded with a 150-MHz Pentium processor, an integrated CD-ROM drive and a floppy drive. The Latitude XPi has a 12.1-in. active-matrix screen, a lithium ion battery and 16M bytes of memory. It will cost $4,399.
- Sharp's WideNote computer has a wide-screen format that leads to theatrical-quality color resolution, according to Sharp representatives. It weighs 4.6 pounds. The laptop allows users to view two Web pages or two Microsoft applications simultaneously. It has a 133-MHz Pentium processor and space for two Type II or one Type III PC cards.

Digital NT workstations

CONTINUED FROM PAGE 41

ing class of technical systems based on highly standardized components and PC architecture. They are aimed at the engineering, mechanical design, 3-D animation, geographic information systems and scientific applications markets.

Predominantly based on Intel architecture, the systems offer a level of graphics and technical computing ability previously associated only with the Unix workstation space — but at far lower cost. An entry-level Digital workstation, based on the 200-MHz Pentium Pro chip, costs less than $4,000. Unix systems — although more powerful and supported by more applications — start at thousands of dollars more [CW, Aug. 26].

"We were favorably impressed with the systems," said Frank Foster, vice president of multimedia at Sony Pictures Imageworks in Culver City, Calif. Foster was an early user of Digital's dual-processor 200-MHz Pentium Pro-based Personal Workstation.

Sony Pictures Imageworks is a special effects company that has used Digital PCs to create effects for movies such as *Speed* and *Johnny Mnemonic*.

Maynard, Mass.-based Digital was among the first to announce NT-based workstations last September and has recently been joined by several other vendors. The most recent is Hewlett-Packard Co., which announced similar systems earlier this month. Desktop market leader Compaq Computer Corp. is waiting in the wings to announce its personal workstation lineup this fall.

"What Digital is doing is good stuff, and they have a great market with these products," said Terry Shannon, editor of "Shannon Knows DEC," a newsletter in Ashland, Mass.

"But watch this space. A lot of others are on the verge of doing similar products," he said.

COMPUTERWORLD
CUSTOM PUBLICATIONS

A well-established media solution used by leading IT marketers

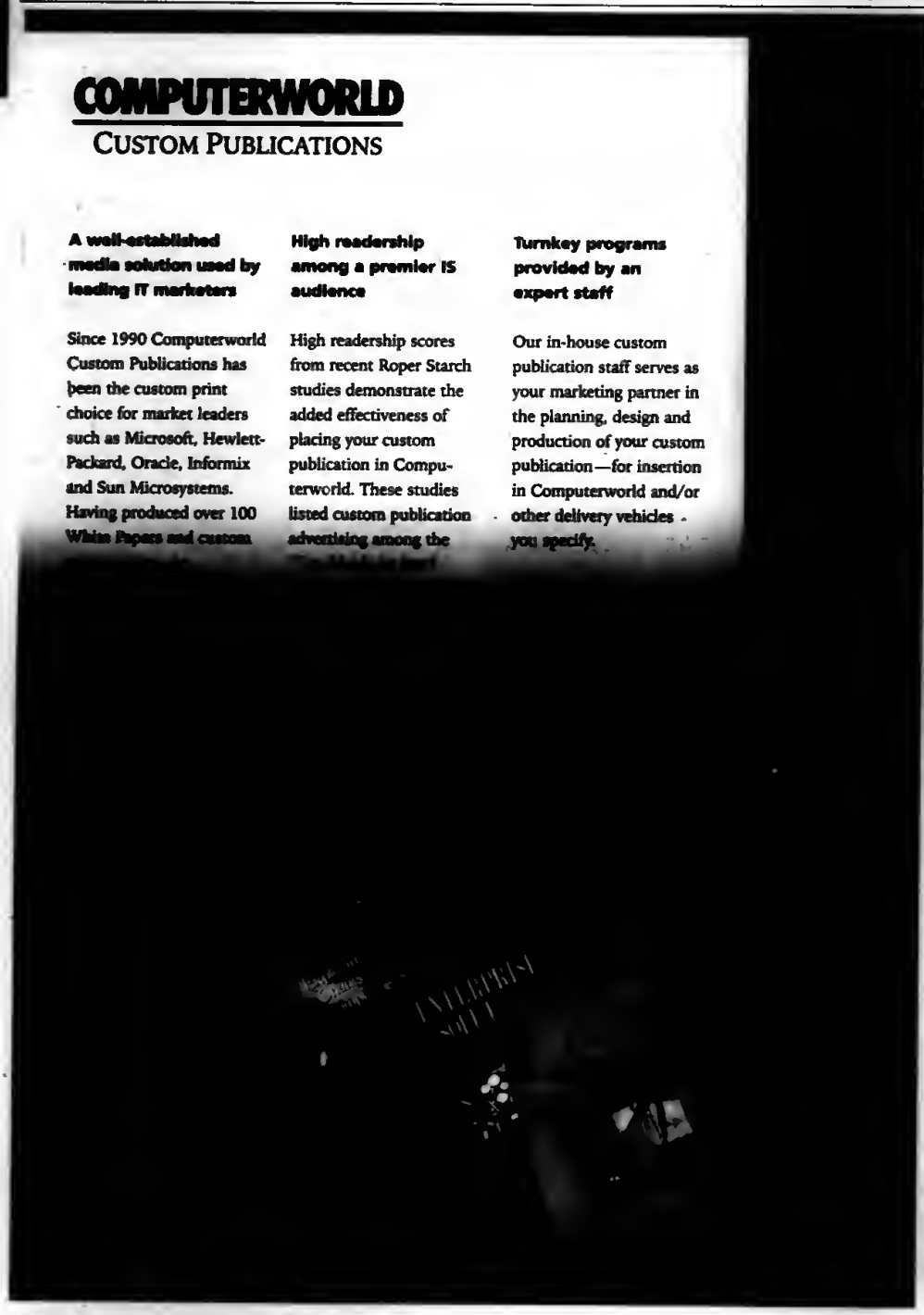
Since 1990 Computerworld Custom Publications has been the custom print choice for market leaders such as Microsoft, Hewlett-Packard, Oracle, Informix and Sun Microsystems. Having produced over 100 White Papers and custom

High readership among a premier IS audience

High readership scores from recent Roper Starch studies demonstrate the added effectiveness of placing your custom publication in Computerworld. These studies listed custom publication advertising among the

Turnkey programs provided by an expert staff

Our in-house custom publication staff serves as your marketing partner in the planning, design and production of your custom publication—for insertion in Computerworld and/or other delivery vehicles you specify.



Fujitsu Stylistic 1000 RF

Mobile devices

CONTINUED FROM PAGE 41

pany isn't interested in wireless access, but might consider it in the future, he said.

Here are features of the recent device announcements:

- The Fujitsu Stylistic 1000 RF with wireless technology from Proxim, Inc. in Mountain View, Calif., weighs 3.6 pounds, has an Intel 486 processor and works with Windows 95. The tablet uses handwriting recognition technology, and a keyboard can be called up on the screen to be used by pointing and clicking. The device will cost between $4,185 and $4,830.
- The Dell Latitude XPi has been upgraded with a 150-MHz Pentium processor, an integrated CD-ROM drive and a floppy drive. The Latitude XPi has a 12.1-in. active-matrix screen, a lithium ion battery and 16M bytes of memory. It will cost $4,399.
- Sharp's WideNote computer has a wide-screen format that leads to theatrical-quality color resolution, according to Sharp representatives. It weighs 4.6 pounds. The laptop allows users to view two Web pages or two Microsoft applications simultaneously. It has a 133-MHz Pentium processor and space for two Type II or one Type III PC cards.

THE BUILDERS

I want a data warehouse for better analysis of my business.

Please send me **FREE** copies of:

- ❑ "Blueprint for Building a Data Warehouse... A Proven Approach for Rapid ROI."
- ❑ "Architecting the Data Warehouse."
- ❑ I'm interested in a **FREE** consultation with a Senior Data Warehouse Consultant.

We are planning a data warehouse project in:

❑ 1-3 months ❑ 3-6 months ❑ 6-12 months

A Project Budget has already been allocated:

❑ Yes ❑ No

E-mail: info@ibi.com WWW: http://www.ibi.com

0000000

NAME

TITLE/DEPT.

COMPANY

ADDRESS

CITY STATE ZIP

( )

TELEPHONE

Information Builders

CALL 000-969-INFO

In Canada call 416-364-2760

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 1305 NEW YORK, NY

POSTAGE WILL BE PAID BY ADDRESSEE

ATTN: Product Information Center
Information Builders
P.O. Box 1461
New York, NY 10117-1484

THE BUILDERS

"WHEN IT WAS TIME TO INTEGRATE 43 DATABASES INTO A WAREHOUSE... IT WAS TIME TO CALL THE BUILDERS."

PJ Matarese, Senior Analyst, Philips Semiconductors

When the competition heats up in the semiconductor business, you accurately match your manufacturing mix, customer demand and profitability or it's time to "cash in the chips." That's why Philips Semiconductors, one of the nation's largest silicon chip manufacturers, decided it needed a faster, more efficient system for key managers to analyze the information stored in the corporation's 40 operational databases. What was the solution? A Data Warehouse built with the help of EDA middleware, FOCUS Six reporting and analysis tools, and an experienced team of application experts...all from Information Builders.

Today, worldwide sales data from three continents is transmitted via TCP/IP network to Philips' data center in Sunnyvale, California. It's then loaded to a mainframe Data Warehouse using EDA middleware technology for data access and migration. Managers and business analysts in Marketing, Sales and Finance access and analyze the warehouse data with FOCUS Six for Windows EIS Edition, and use FOCUS Six Reporter to create ad hoc reports. The result... business managers keep manufacturing in sync with market demand through better forecasting; while IS managers spend their time developing other strategic systems instead of generating 300 pounds of custom reports each month.

Philips Semiconductors is just one of thousands of examples of how Information Builders has partnered with the world's leading corporations to build enterprise-level reporting and analysis systems. Find out how Information Builders' technology and services can help your organization. Call us at 800-969-INFO.

http://www.ibi.com

800-969-INFO

In Canada Call 416-364-2760

Information Builders

FOCUS and EDA/SQL are trademarks of Information Builders, Inc., NY, NY 212-736-4433 E-mail: info@ibi.com WWW: http://www.ibi.com

Nothing is more uncomfortable than discovering

You buy a server, your company grows, you buy another server, your company grows. It's time to break this vicious cycle. Introducing the Sun™ Ultra™ Enterprise™ Servers. The mainframe-caliber servers designed to grow as your company grows—without the usual cramps or compromises. Whatever your business needs, whether it's multiple-terabyte

your server is too small.

data warehouses or the ability to support thousands of users, Sun delivers. Best of all, you'll never wake up crammed in to a corner. Modular, scalable design lets you add CPUs and pump up I/O bandwidth as needed. Redundant, hot-swappable components, along with round-the-clock service and support, deliver the reliability to keep your mission-critical applications up and running. All of which adds up to enough network computing power to cover your entire business, no matter how quickly it grows. Sun Ultra Enterprise Servers. They're every reason you bought a mainframe, and every reason you didn't. To learn more, contact Sun at http://www.sun.com or give us a call at 1-800-786-0785, Ext. 390.

Sun

THE NETWORK IS THE COMPUTER™

What's the net net?

Microsoft Internet/Intranet solutions.

Come to a free, half-day briefing and find out how the right solutions can help your company work smarter—and more profitably.

As you know all too well, talk is cheap, but technology isn't. That's why we're cutting through all the chatter to provide you with a strategic overview of new technologies which can help keep information, work and profits all moving together.

You'll get an inside look at Microsoft technologies for today and tomorrow, including highlights of the latest Internet/Intranet developments and how they're incorporated in many of our products. You'll observe the latest Microsoft-based solutions for taking advantage of Internet business opportunities, maximizing the benefit from communication-enabled line-of-business applications, enhancing team collaboration with a company Intranet, and more. You'll see first-hand how Microsoft Solution Providers are uniquely qualified to provide you with solutions at an unprecedented level of functionality. And you'll have a chance to sign up with a Solution Provider to conduct a customized evaluation of Microsoft Internet and Intranet products, the latest version of Microsoft Office, Windows® 95, BackOffice™, and development tools.

If you're a business decision maker or information technology professional in an organization with 100 or more employees, and you need to use technology to accomplish business objectives, this briefing is for you.

Call (800) 836-8282, Dept. A778 today to get information about a briefing near you.

Publication Sponsor
COMPUTERWORLD
The Newspaper of Information Systems Management

Microsoft
WHERE DO YOU WANT TO GO TODAY?

©1996 Microsoft Corporation. All rights reserved. This document is provided for informational purposes only. MICROSOFT MAKES NO WARRANTIES, EXPRESS OR IMPLIED, IN THIS SUMMARY. Microsoft and Windows are registered trademarks and BackOffice and Where do you want to go today? are trademarks of Microsoft Corporation

Special Advertising Supplement

September 30, 1996

White Paper

IDC
INTERNATIONAL DATA CORPORATION

RAID's Many Flavors Give IT Managers Many Options

Emerging Trends in Open Systems Storage

The NCR Scalable Data Warehouse.

#1 IN DATA WAREHOUSING

Once again, NCR is leading the way in data warehousing. Using NCR's robust Teradata® database and EMC™ intelligent storage, coupled with our highly scalable WorldMark™ servers, we built the world's first data warehouse large enough to handle 11 terabytes of data. Or 2.75 billion pages of text.

NCR's WorldMark servers with EMC's Symmetrix® storage allow you to turn mountains of raw data into useful information with unprecedented speed, giving you unmatched querying capabilities. And only WorldMark servers offer you a platform that scales from SMP, to clusters, to MPP, allowing you to start your data warehouse small and grow it to any size.

To get more information about NCR's scalable data warehouse, call 1 800 CALL-NCR, ext. 3000. Or experience our data warehousing capabilities firsthand at: http://www.ncr.com. Or visit http://www.emc.com

intel inside pentium

EMC² THE STORAGE ARCHITECTS

NCR

All WorldMark servers shown feature Intel Pentium processors. The Intel Inside and Pentium Processor logos are registered trademarks of Intel Corp. The Wall St. Journal 2/27/96. Reprinted from The Wall St. Journal © 1996 Dow Jones & Co., Inc. All rights reserved. EMC² and Symmetrix are registered trademarks and EMC is a trademark of EMC Corporation. Teradata is a registered trademark and WorldMark is a trademark of NCR Corp. ©1996 NCR Corporation. All rights reserved.

Introduction

Around-the-Clock Need for Storage Access Creates Day of Demand for RAID

Storage has become a critical component in the IT infrastructure. Users are clamoring for access to storage, consistent performance and storage management capabilities — and they want them around the clock. How can you be sure that the mission-critical data on your LANs will be there when your users need it? How will you provide the fault tolerance and high availability users have come to expect from mainframe-based systems without compromising your cost structure?

Many IT managers are convinced that the answer to these questions is RAID (Redundant Array of Independent/Inexpensive Disks) technology. Use of RAID is increasing in all classes of network systems and servers.

How fast is the market for RAID products growing? Just 24 months ago, RAID-configured subsystems comprised over 45% of all multiuser storage shipments. Today the figure is 80%. RAID has become a mainstay technology for ensuring continuous data access.

RAID vendors are maximizing their products' throughput by investing in disk array controllers. But IT managers' options for RAID are not limited to high-capacity disk farms and expensive controllers. They can also increase reliability and performance through server-based software. Host-based software arrays, which create a virtual disk environment with existing LAN storage devices, offer excellent administration and configuration flexibility.

Successful deployment of RAID requires understanding its benefits, its advantages and disadvantages, and how to determine the "sweet spots" and price/performance of products in this area. As vendors move to open systems solutions, the cost of ownership for their disk arrays is dropping. In addition, new features such as hot-swap capabilities and hot-sparing are making RAID-based disk arrays even more attractive for high-availability applications.

This White Paper will take a look at some of the trends, products, distribution strategies and technology requirements for RAID in the open systems marketplace.

This White Paper was written by Thomas Lahive, Senior Storage Analyst at International Data Corp. The goals of the White Paper are: to define trends in the storage marketplace; to describe different storage product offerings and feature sets; to outline pricing considerations; to outline the product lines of leading vendors; and to educate the readers about the impact of critical components on performance. For more information about the topics addressed in this paper, readers can contact Lahive at 508-935-4499, (fax) 508-935-4339 or tlahive@idcresearch.com. Also contributing to this report was Robert Gray, Research Manager for Storage Subsystems at IDC. IDC is the IT industry's leading provider of market research and consulting services.

COVER ILLUSTRATION BY CHRISTOPHER BING

All rights reserved by CW Custom Publications, 500 Old Connecticut Path, Framingham, MA 01701

Implementing RAID

What IT Managers Need to Know

The loss of stored data can put a corporation out of business. Is it any wonder that storage has become a critical component in the IT infrastructure?

Storage has historically represented 20% to 30% of what a company would pay for a system. But today, storage often accounts for as much as 35% of the cost of the server value.

The reason for this increase is simple: Companies need more storage than ever. Today's storage configurations routinely entail many hundreds of gigabytes, and even as the price of a megabyte drops, it is common for these configurations to cost more than $200,000. In fact, this year alone companies will spend more than $25 billion on multiuser storage products.

The fear of losing critical data has driven many corporations to invest heavily in disk arrays, which offer a high degree of fault tolerance through redundant components and the use of RAID technology. Since being developed at the University of California, Berkeley in 1987, RAID technology has been applied to storage systems to improve system performance and reliability.

The most critical mechanical components inside a server — the disk drives, the fans and the other I/O devices — often break (like most things that move).

What's in a RAID level

Understanding and deciding which RAID level to operate can be as difficult as designing RAID subsystems. Some vendors recommend mirroring; others suggest RAID-5 (spreading the parity). Each subsystem controller has its own tricks that optimize performance for the particular disk array. As a result, some products work well when mirrored and others offer very little performance hindrance when reading or writing parity data as in RAID 3 or 5. Another group of vendors has developed unique RAID levels to alleviate I/O bottleneck associated with parity data. Though no size fits all, the chart blow will help you decide which RAID level to implement.

FIGURE 1

Pros and Cons of the Flavors of RAID

Level	Description	Advantages	Disadvantages
RAID 0	Data is striped equally across all other drives and does not write parity information.	No performance or capacity losses, as it appears to host as one logical device.	Offers no level of availability — a lost drive means loss of data. No protection is built into RAID 0.
RAID 1 – Disk Mirroring	Duplicates data from one drive to another. If at any time a drive fails, an exact copy can be reconstructed	Provides a high degree of data availability, since the likelihood of both drives failing is highly improbable.	Expensive — half of the subsystem capacity is unusable.
RAID 3	Data is distributed across all the drives so missing data can be mathematically reconstructed from remaining drives in the array. Data is striped across array; and logical records are made and written to a separate drive that contains this parity information.	Less overhead associated with parity than mirroring. Works well with large block sizes and large request sizes. Offers excellent read and write performance.	Poor performance in OLTP environments due to high number of I/O requests. Small request sizes will waste disk space.
RAID 5	Reads and writes separate disks independently so that parity is spread across all drives.	Capacity overhead is less than mirroring. Suitable for high I/O rates at short block sizes. Offers overall excellent performance at read-intensive operations in OLTP environments.	Update performance is degraded. Referred to "RAID 5 Write Penalty" whereby four operations are conducted during a write cycle.

Source: International Data Corp.

Since the first line of defense against data loss is to protect against disk drive failures, companies are spending more of their storage budget on RAID configurations than JBOD (Just a Bunch Of Drives) configurations, which consist of "dumb" or "limited intelligence" storage drives that offer no data protection at all.

RAID technology is "smart" because it generates extra bits of data from existing data, allowing the system to create a "reconstruction map" so that if a hard drive fails, it can rebuild lost data.

RAID can be implemented in different ways. In the simplest form, RAID subsystems duplicate the data on drives. This process, called mirroring, provides an exact copy that protects users fully in the event of data loss. But mirroring has a downside: cost. If full copies are always to be kept current, users need to double the amount of storage capacity that is kept on-line.

Other RAID methods are less expensive because they only partly duplicate the data. This allows storage managers to minimize the amount of extra disk space (or overhead) they must purchase in order to protect data.

Although RAID does not 100% guarantee that you will always have access to your data, a properly configured subsystem is the best way to limit costly downtime.

Fault tolerance extended

As RAID has evolved, storage subsystems vendors have extended the concept of fault tolerance beyond just the rotating disks inside a drive. They have increased the overall level of redundancy in their products by adding a level of fault tolerance across all of the critical components inside the subsystem: the controller, fans, power supplies and other potential points of failure.

IDC divides the storage subsystem market (which consists of both RAID and JBOD) into internal and external units. In internal subsystems, disk drives are embedded inside the system cabinet or rack and often share the same power supply, fans and I/O logic as the host CPU. In external subsystems, drives reside in an enclosure which is external to the system cabinet and which has its own power supply, fans and, often, controllers. The storage subsystem is attached via a SCSI interface or other form of cable to the host CPU.

Internal storage is typically less expensive than external storage. Users of external storage units pay for additional packaging, but gain benefits such as higher performance controller boards, increased expandability, another level of fault tolerance, modularity and support for several host CPUs.

Most external configurations are sold by third-party vendors — suppliers that manufacture the storage subsystem but not the host system. For buyers, this means that they have options for external storage beyond their systems salesperson.

Centralized storage

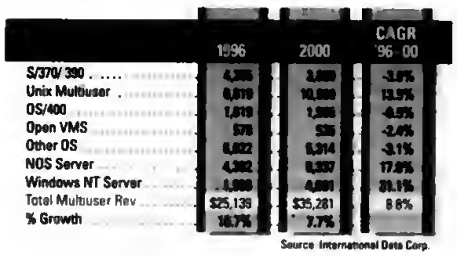
In the open systems marketplace, 60% of all storage revenues are generated by external disk arrays. IDC expects this percentage to grow to more than 70% by the year 2000. The main reason for the rising popularity of external storage is that it allows users to attach multiple host systems to one storage subsystem. This process of centralizing storage is becoming increasingly popular with IT managers — particularly those at sites with several different servers — because it simplifies storage management. One storage device can connect to all the different servers, and being able to support all the different storage requirements of servers connected by multiple operating systems is a very attractive proposition for an IT manager, as is significantly reducing lifetime management costs.

There are two main reasons for the trend toward centralized storage. Reason #1: The total cost of centralizing is less than that of distributed, in which the cost to manage exceeds the cost of purchase. In other words, although the purchase price of a storage solution may amount to less than $1/MB, the cost of managing it may be 20 times as much. Users should make sure that their initial storage product line lets them manage storage easily. Reason #2: The performance of centralized storage will exceed desktop client storage, because the network disk in centralized storage servers can perform two to four times faster than a single logical disk inside a PC.

The number of sites with multiple servers running multiple operating systems is increasing. In a recent IDC survey, 71% of sites had multiple midrange servers and 60% of them had a combined midrange server, LAN server and mainframe. Over 90% of the sites plan on migrating key applications to a midrange or LAN-based server.

FIGURE 2

Worldwide Disk Storage OS Revenue, 1996-2000



Source: International Data Corp.

The reason why this is happening is that applications being written for open systems environments now offer the same levels of availability and reliability as those written for proprietary environments, more applications are being written for open systems environments. It used to be that IT managers were not satisfied unless all of their treasured data resided on the mainframe. Now that that information resides in Unix environments, safe storage is critical to the peace of mind of today's IT managers. Vendors of systems and of storage solutions realize that to support this transition, they must offer solutions such as subsystems that support several operating systems.

Systems vendors have historically controlled over 95% of storage expenditures worldwide. There were many reasons for their dominance, including pricing, packaging, support and distribution (it was easy to purchase storage by writing another check to the salesperson who had come to install your system) . . . and they guaranteed that their storage products were compatible with the host system or server.

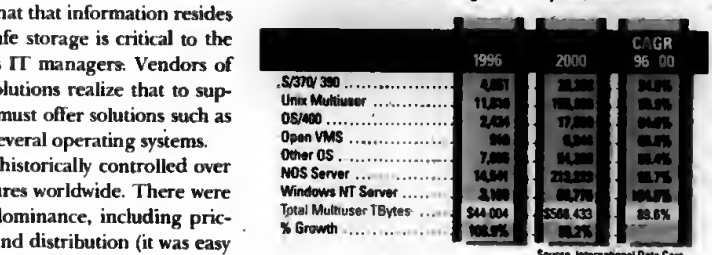
But as users began to demand features such as multi-host OS support, higher performance and increased rellability from their disk arrays (and lower prices and better support from their suppliers), systems providers began to lose market share. Today, systems providers are hamstrung in their ability to increase storage revenues by conflicting business objectives. While users are demanding multi-host support, a systems vendor must optimize its storage products for its own captive base.

As a result, even though all storage vendors enjoyed significant growth in 1995-96, third-party providers grew faster than systems providers (Table 3), because they were more able to support multiple host operating systems. But operating systems support is only one way in which vendors differentiate their external disk arrays. Other factors include level of fault tolerance, capacity and cache support. Table 4 compares external disk arrays and describes product strengths or uniquenesses.

The storage arena is particularly prone to inbreeding; vendors in this marketplace commonly purchase products from competitors and resell them. As a result, IT managers will often be looking at a RAID array that has many different vendors' products inside. IT managers should not be reluctant to purchase such a product. IT managers facing a purchasing decision must consider the completely packaged product and what level of service they will receive from the ultimate supplier. It is generally both cost- and performance-effective to buy a product that offers best-of-breed componentry.

FIGURE 3

Worldwide Disk Storage DS TBytes, 1996-2000



Source: International Data Corp.

There are three critical components in a subsystem: disk drive, controller and packaging (which comprises power and cooling). The primary suppliers of drives — Seagate, IBM, Quantum, Western

HDS Midrange 5400 Tape and 5700 Disk Series

Go ahead, get wild when you workout. But when it comes to RAID storage, don't fight your obsession for avoiding risk. Simply choose the 5700 Series from Hitachi Data Systems. It's the RAID storage system that delivers hot pluggable controllers, fans, disks and power supplies. All with the granularity of four models based on the same architecture. So it can grow as you grow—from modules as small as 2 GB

to as large as a terabyte. And you can move from platform to platform, without wrestling with compatibility issues. In addition, this worry-free solution delivers selectable RAID levels, optimized microcode and an incredibly efficient cache design for outstanding performance. But don't take our word for it. Check out a 5700 Series evaluation unit for yourself. Call now and get your RAID storage in the best shape ever.

***FREE* *NO RISK EVALUATION UNIT OFFER**

Call to qualify and schedule. 1-800-910-2820, ext. 239 • www.hdshq.com/raid

HDS

Hitachi Data Systems

SUPPLYING THE DEMANDING

*Evaluation offer valid for 30 days from issue date of this publication and does not include freight costs. Hitachi Data Systems, 750 Central Expressway, Santa Clara, CA 95050-0996. Outside the USA, call +334-940-9485.

Digital, Fujitsu, Hitachi and Micropolis — all offer either Fast/Wide SCSI 3.5- or 5.25-inch form factor. Although these drives are SCSI-based, almost every system vendor and third-party provider customizes and configures the storage environment for a specific drive maker. For example, Seagate, the leader in market share among suppliers of high-capacity (greater than 1GB) drives embeds XOR technology onto 5.25-inch drives specifically for EMC.

Some RAID and SCSI controller boards are designed by independent suppliers such as Mylex, DPT, CMD, American Megatrends and Adaptec. They in turn supply systems and third-party vendors (Adaptec, for instance, supplies Compaq). It doesn't matter who the manufacturer is; most implementations are customized for that vendor. Designing one's own controller board is not uncommon but is very costly and may take several years. To justify that type of investment, a $50 million product line is usually required.

Although many of the individual components are commercially available, IDC does not recommend that users piece together their own subsystem. When users put critical data on home-grown storage sub-

When users put critical data on home-grown storage subsystems, it is a nightmare. SCSI technology is supposed to be plug-and-play, but there are many hindrances to making it work.

Leading Open Systems External Disk Array Quick Product Specifications

Manufacturer/ Product	RAID Level	Capacity (GB) per Cabinet	Cache (MB)	Comments/Key Differentiators
Amdahl/*LVS 4500*	0, 1, 3, 5	21 to 386	1,280	Network managed multi-host storage delivering 24/7 performance and data availability, non-disruptive, upgradable; scalability, capacity, cache, data paths and bandwidth.
Andataco/*Enterprise Storage Packaging*	0, 1, 3, 5	32 to 382	640	Designed as a cableless system utilizing Ultra-SCSI architecture offering high availability. A local, Internet, and Internet storage management and configuration software utility is bundled.
Baxhill/*5300*	0, 1, 4, 5, 0/1	4 to 504	256	Above average scalability, complete system redundancy, attractive pricing and corporate HQ is in NYC, giving it Wall Street market niche.
Data General/ *CLARiiON 2000*	0, 1, 3, 5, 1/0	2.5 to 336	128	Highly fault-resilient mainstream storage product. Extremely tight microcode, minimal overhead RAID engine.
Digital/*410*	0, 1, 3, 5	12.6 to 160	32	Modular, available through multiple channels, worldwide service and support, and can be upgraded quickly by end user.
EMC/*3900*	0, 1, 5	88 to 1,116	4,096	High scalability, supports most operating systems, extensive service and maintenance, and complete redundancy.
Hitachi Data Systems/*5750*	0, 1, 5	4.0 to 83	256	High fault tolerance even at low capacity points.
HP/*XLR1200*	Adaptive 0, 1, 5	24 to 240	72	Log-structured file system in conjunction with dynamic data redundancy (mirroring to RAID 5) management at a low $/MB.
IBM/*7133*	0, 1	16 to 432	N/A	Next generation serial architecture, SSA design, offering performance at 3,000 I/Os and 80MB/sec loop bandwidth. Low $/MB.
IPI/*ESS*	0, 1, 5	32 to 256	4,000	Software allows system to download data automatically from desktop server to glass house and offers integrated back-up and recovery solution.
MTI/*9300*	0, 1, 0+1, 5	8 to 504	256	Network cross-platform managed storage, redundant controllers, dual host connections, write-gathering cache, data consistency check, and scalable components.
NCR/*6271*	0, 1, Other	138	2,016	Marketed as an entry-level (scalable to TB+ capacities) disk array to the enterprise subsystem market, customers can maximize availability through the utilization of fully redundant componentry and full backup with a remote data facility option.
Storage Computer/ *RAID 7 - Storage Super Server*	1, 3, 5, 7	136 to 1,123	1,096	High-performance, network manageable (SNMP), shared storage services for all SCSI hosts, with concurrent multi-host, high-speed (40MB/sec, 160MB/sec) external connectivity; fault-tolerant, multi-level mirroring; 3-year warranty.
Storage Dimensions/ *Superflex 5000 Series*	0, 1, 5, 0/1	4 to 140	32	Cross-platform, host independent with innovative backplane design offering interchangeable I/O modules. Dual redundant controllers with active/passive capability.
Sun/*SPARCArray 200*	0, 1, 5	7 to 324	4	Low-cost solution offering high capacity and long reliability.
Symbios Logic/ *Series 3 FSM0*	0, 1, 3, 5	80 to 240	768	Very competitive RAID price/performance with a growth path to new I/O technologies. Fully fault tolerant storage system with gold-level RAB certification.

Source: International Data Corp.

How Does Your Storage Purchasing Strategy Match Up?

Are your storage purchasing strategies in the "norm"? IDC recently surveyed nearly 1,000 midrange sites. Here are some samples of their storage purchasing behavior.

On average, the prices of hard disk drive decline 3% per month. This motivates users to buy storage as needed, which means that multiple disk drives at multiple instances are added continuously (weekly to monthly) as opposed to in large blocks at cyclical periods. On average, 70GB per site will be added in 1996, which represents a doubling of storage.

Application performance varies with different RAID levels. The more relevant an application is to a business environment, the higher the rate of RAID usage. But even in the mission-critical applications, only half the storage is protected.

With the price of RAID dropping, IT managers should add storage in order to get 100% protection for mission-critical applications. However, RAID does not offer 100% disaster tolerance and does not replace regular backup.

How users ranked their applications in order of RAID usage:

1. Back-office, OLTP applications
2. Front-office, OLTP mission-critical
3. Operating system
4. Systems management
5. Office Productivity
6. Development Tools
7. Non-mission critical applications (only 32% capacity protected)

Vertical markets buy and use storage differently. The transportation and communications industries have the highest average capacities, typified by the database applications at these sites. (Databases occupy 60% of capacity at midrange sites.)

Although the second largest industry, finance, also has large databases, the mean capacity for these systems is less than other industries. Manufacturing, retailing and agriculture have the least capacity, reflecting lower levels of IT investment. Average capacity by vertical industry:

Communications and Transportation: 92.2GB, with 10.6% having more than 250GB

Finance: 74.6GB, with 5.8% having more than 250GB

M/R/A: less than 1% have greater than 250GB

Plans for consolidating storage also vary by industry. Healthcare, retail and communications have more aggressive consolidation plans than banking. This is not surprising; the finance industry's disaster recovery requirements limit its ability to consolidate. However, consolidating to multiple sites offers another level of consolidation and availability.

Of midrange sites, 33.4% already have centralized storage or will do so within 12 months; the rest either do not yet have plans to centralize storage or are against the idea.

When IDC polled users about consolidation in terms of capacity, it determined that 49.7% have centralized storage or will consolidate in the next 12 months; the rest either have no plans to consolidate or have decided against it.

Storage is purchased through multiple channels. Private sectors, especially banking, tend to buy direct from the manufacturer in order to obtain the common source benefits. Government agencies, which typically must initiate RFQs, purchase by lowest bid. Healthcare, non-banking and public/government are likely to purchase storage from third-party providers. Manufacturing, banking and transportation prefer the systems brand.

Storage is purchased:

Direct from a systems manufacturer, 53.8% of the time

Through a reseller from a systems manufacturer, 29.8% of the time

Direct from a third-party supplier, 10.9% of the time

Through a reseller of a third-party supplier, 5.5% of the time

Open systems environments are the highest growth operating systems. Open VMS, AS/400 and Other OS sites are not adding as much storage as open systems environments, which are generally considered to be legacy systems with fewer new applications required of them. Of the entire midrange install base, storage revenue OS is distributed as follows:

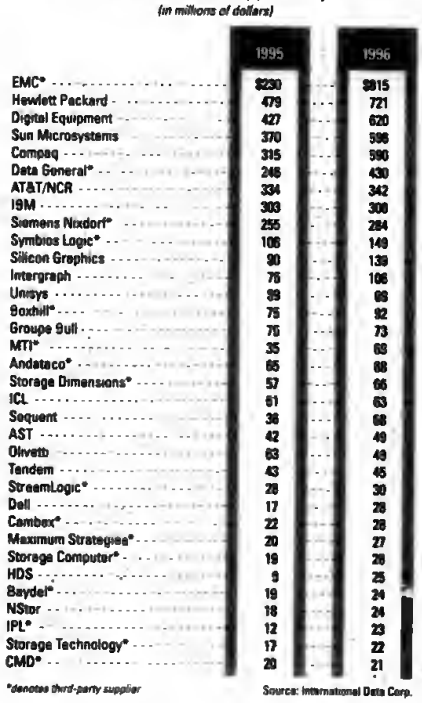
46% Unix
27% AS/400
10% VMS
7% Other OS

systems, it is a nightmare. SCSI technology is supposed to be plug-and-play, but there are many hindrances to making it work. Also, designing one's own subsystem is difficult, for reasons that include: system compatibility, from the controller board to the host CPU; verifying recover under all failure modes; optimizing the cache for specific block sizes and I/O request rates; integrating a storage management utility; and designing the proper redundancy, cooling and power.

When all is said and done, a user can easily spend $25,000 for a disk array that can support 10 drives. Though at $0.58/MB, this sounds affordable, there are many competitively priced third-party solutions that offer more redundancy and more support.

External Open Systems Suppliers by Revenue

(in millions of dollars)



*denotes third-party supplier

Source: International Data Corp.

IDC believes that terabyte growth will more than double every year for the next five years. Most of this growth will come from open systems operating systems such as Unix, NetWare and NT. Proprietary markets (i.e., MVS, VMS and AS/400 environments) do not offer the same growth rates.

Drive capacity doubles every 18 months, while the average price per spindle remains constant. For instance, two years ago, $1,200 bought a1GB 3.5-inch drive; today that same money will purchase a 4GB 3.5-inch drive. Although standalone drive prices are less than $0.30/MB, users are paying $0.50 to $2.20/MB for a packaged open systems subsystem. The extra cost per megabyte is due to five factors:

1) RAID controllers, which cost $1,400 to $15,000
2) memory or cache ($35 to $110 per MB)
3) packaging, cooling and power (up to $20,000)
4) software (can be bundled with the subsystem or can cost $50,000 for remote copying utilities)
5) service and support (often priced with capacity)

However, each of these items can be negotiated for at the time of purchase.

Disk arrays do more than support the I/O of a host CPU; depending on the application, they can affect overall system performance positively or negatively. Users should be cognizant of the application the subsystem will support. They may not need certain cache configurations, specific capacity requirements or multi-host operating system support.

Conclusion

Before making a purchase decision, users should know how to determine a product's "sweet spot" — a combination of capacity, operating systems support, availability and price. They should do more than just review product literature; performance and host server compatibility cannot be measured by looking at a spec sheet. Each subsystem was designed for a specific operating system or a specific business application.

Users should try to negotiate how much they pay for a megabyte, and should also consider limitations in application performance and support. If not, the initial investment will only be a fraction of the storage cost, with additional money required to make the IT environment reach optimal performance. Put another way, depending on your driving conditions, your mileage may vary.

Fault Tolerant Decision

Check us out.

TEL: (603) 880-3005
http://www.storage.com

STORAGE COMPUTER®

Advancing the state-of-the-art in open storage

R A I D S Y S T E M S

IF YOU LISTEN CLOSELY YOU CAN ALMOST HEAR THE DATA **SCREAMING.**

For network storage managers, data that screams means clients who don't. Brighten up your client/server environment by pushing information at bypersonic speed with a Symbios Logic MetaStor RAID system.

Only MetaStor products combine industry-leading performance with the highest fault tolerance and the lowest price in their class. The DS-20*E*—with up to 84GB of capacity and 6,550 I/Os per second per controller—is ideal for enterprise storage, while our DS-10, with up to 42GB, is the best solution for LANs. Both are available in desk-side or rack-mount configurations and support all major operating systems. To back-up these superior performers, nothing is better than the MetaStor DLT Tape Array, which can back-up 160GB at up to 22GB per hour.

METASTOR™

Symbios Logic is the world's leading authority in RAID technology. We developed the first RAID chip set, and we build our MetaStor products from the silicon up. That's why they're the fastest, the most reliable, the best value out there.

Learn how Symbios Logic can help you put fear into the heart of slow-moving data. Call 1-800-86-ARRAY, or visit our Web site at www.symbios.com.

(6,550 I/Os/sec)

© 1998 Symbios Logic Inc. Symbios Logic and SYMBIOS are trademarks of Symbios Logic Inc.

OLAP Council to post first interoperability standard for database products, 52

Software

Coming from behind

Informix plays catch-up in workgroup databases, OLAP tools

By Craig Stedman

After falling off the map in workgroup databases and OLAP tools, Informix Software, Inc. is making a determined bid to gain ground on rivals Oracle Corp. and Microsoft Corp.

Informix has been slow to ship a spiffed-up workgroup database to replace the aging and limited Informix SE, and its MetaCube software for online analytical processing (OLAP) hasn't made many waves thus far, analysts said.

This month, however, the company expanded platform support for its OnLine Workgroup Server database, which was released in June on Windows NT 3.5 only. It also detailed a MetaCube 3.0 release with several new features (see chart).

In the mix

Informix is adding the following features to its workgroup database and analysis tools

OnLine Workgroup Server database:

- Support for Windows NT 4.0
- Unix support, including Solaris, HP-UX, AIX and SCO OpenServer
- Free 60-day trial version that can be downloaded via the Internet

MetaCube 3.0 OLAP tools:

- Framework that lets users embed their own custom capabilities
- Sampling feature for extrapolating query results from data subsets
- Optimized for use with Informix databases

Nick of time

OnLine Workgroup Server came along just in time for Tropic Tex International, a New York-based importer of women's sportswear that was bumping up against the scaling and performance limitations of Informix SE.

"This is a completely different engine, and it's much faster," said David Roth, database administrator and project manager at Tropic Tex.

On the decision-support application that Tropic Tex runs, query performance and database loading are both five to 10 times faster with OnLine Workgroup Server, Roth said.

One drawback, however, is that OnLine Workgroup Server requires a higher level of fine-tuning, Roth added. Informix advertised the new database as a load-and-go product that has a simple graphical user interface (GUI) for administrators, "but sometimes a GUI covers up what's really behind there," Roth said.

Informix officials insisted that OnLine Workgroup Server is easier to install and use than rival products such as Oracle Workgroup Server and Microsoft's SQL Server. Dan Kusnetzky, an analyst at International Data Corp. (IDC) in Framingham, Mass., agreed.

But the slow path that Informix took to ship OnLine Workgroup Server has put it well behind Oracle and Microsoft in the low-end business.

For example, Informix's share of the workgroup-oriented Windows NT database market fell from 14% in 1994 to just 1.4% last year, according to IDC.

Windows NT-based databases "are largely a Microsoft/Oracle kind of domain right now," said Richard Finkelstein, president of Performance Computing, Inc., a database consultancy in Chicago.

Informix also is fighting an uphill battle in OLAP tools. These tools let users run complex database queries that analyze several facets of a subject. MetaCube didn't register in IDC's 1995 breakdown of OLAP tools market share, and it has kept a low profile until now, said Frank Gillett, an analyst at Hurwitz Group, Inc. in Newton, Mass.

Does Java really need the refills?

By Frank Hayes

As corporate developers gear up for bigger projects with Java, software tool vendors are preparing to roll out team-programming support. But some developers question if the tools are needed.

Java support

Symantec Corp., which recently released a Visual Basic-like Java tool set called Visual Cafe, plans to offer an enterprise edition designed to support a group of Java developers. The Cupertino, Calif., company wouldn't discuss pricing or details of the product but said it will be modeled on Sybase, Inc.'s PowerBuilder Enterprise package, which costs about $3,000 and includes tools such as a configuration management system.

"We've got a couple customers who want to build some really big applications in Java," said Gavin Scott, a software engineer at Denkart, Inc., a Java consulting firm in Redwood City, Calif., that uses Visual Cafe. "There's definitely a need for larger development team support."

Independent work

But other Java developers said they aren't so sure. They noted that because Java, Sun Microsystems, Inc.'s Internet development language, is strongly object-oriented, it is easier to break programming projects into small parts that don't require lots of coordination among individual programmers.

"We have a team of Java people, but each developer is doing a separate piece," said Phil Gibson, director of interactive marketing at Na-

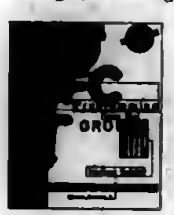
Java, *page 52*

Books about Microsoft Foundation Classes

Microsoft Foundation Classes (MFC) comprise a library of reusable objects for Windows C++ application development. Don't know how to use them? Here are some books that will tell you how:

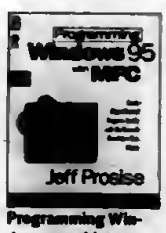
MFC Programming from the Ground Up **by Herbert Schildt. Osborne/McGraw-Hill, Berkeley, Calif.; 656 pages, $34.95.**

This is without a doubt the best book for beginners reviewed here. If you know nothing about MFC, this is a good place to start. Not only does the book explain concepts such as CTabCtrol in language that anyone can understand, but it is laid out beautifully. Charts and screen shots, as well as a typeface that is easy on the eyes, dominate. Chapters include MFC fundamentals, processing messages, introducing dialog boxes, working with graphics, managing text and thread-based multitasking.



MFC Programming from the Ground Up *is best for beginners*

There are a couple of possible downsides, though. Unlike other similarly priced books, a CD-ROM isn't included. You may not care about that, especially given the mounds of code that are in the book. Also, the book's jacket says this applies to Version 4.0, but I couldn't find a discussion specifically about 4.0's new features and functions. If you are an MFC programmer looking for specifics about Version 4.0, this book isn't for you.



Programming Windows 95 with MFC *is detailed and clear*

Programming Windows 95 with MFC **by Jeff Prosise. Microsoft Press, Redmond, Wash.; 999 pages, $49.95 with CD-ROM.**

Inside the book's front cover is a two-page view of the MFC 4.0 class hierarchy. No, a magnifying glass isn't included, but almost everything else is.

This is an exhaustive refer-

Book reviews, *page 52*

Office 97 wins with E-mail/organizer combo

By Jeffrey Gordon Angus

I am really very happy that some software publisher figured out how to organize an office suite before Homo sapiens evolved into a different species. It's Microsoft Corp. that cracked the code, as embodied in the beta version of its soon-to-be-released Office 97.

The great leap forward is that instead of being a big bucket of programs tied together by a product name and a couple of cranky integration tools, Office 97 is structured as a set of applications wrapped around a logical hub. Even better, because most networked computer users live in their electronic mail and busy white-collar folks live by their personal organizers, Office 97's hub is a synthesis of E-mail and a personal organizer. In Office 97, the hub is called Outlook 97.

PRODUCT REVIEW

Outlook is an advanced stand-alone calendar, contact and to-do program. Microsoft synthesized it with Exchange and Schedule Plus, its E-mail and group calendar offerings, so that all the dynamic data resides in one interface and is fully transportable. This daily routine is tied together into projects, and Microsoft centralizes project organization through a utility called Binder.

Binder, introduced in the previous version of the suite, is a mechanism to bring together all documents related to a project, regardless of which Office application they were created in.

So you have a sensible, cascading organization for your work; projects are related to the people, appointments and action items in your organizer; and documents are related to the projects they are part of. The main Office 97 applications — Word, Excel, Access and PowerPoint — are put in their places, serving as means to an end.

Putting them all together

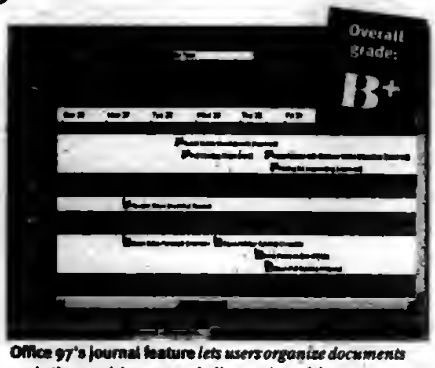
Here is how it works. Outlook has a series of buttons for basic functions: Inbox, Calendar, Contact List, Task List, Sticky Notes and what Microsoft calls a Journal. All these screens work together for drag-and-drop copying. This means, for example, that you can drag an appointment to E-mail to forward it to a peer. You also can share contact records via E-mail, turn an appointment into a to-do item or put a shortcut for a document or World Wide Web site in an appointment entry.

This model extends to the primary Office applications, so you can also put a contact into a Word letter template.

There is some flexibility uncommon in the personal information category, too. If you have a paper supplier named John Jones, you can elect to "File as" the record under "P" for paper supplier instead of under "J" for a last name you may not remember.

The Journal is a concept I haven't seen before in an electronic form. It is a way to organize documents and other work into a rough, linear view of time. Because you can also create discrete tabs according to the type of Journal entry (such as E-mail, meeting, spreadsheets and so on), you can document your daily work and use that documentation to find "lost" items. You also can conveniently double-click on something to open it.

Power users will appreciate the ability to "Group By" categories in these areas. Just as you can sort E-mail by sender's names, dates or other attributes, you can organize your tasks or journal entries, for example, based on any of their attributes by dragging the attribute headers to the top of the window. And you can do it by multiple attributes. The "Group By" feature, which is similar to the folders concept in Lotus Development Corp.'s Notes, makes for very powerful management for sophisticated, busy users.



Office 97's journal feature *lets users organize documents and other work into a rough, linear view of time*

Power users will get a lot out of this application and the whole suite. Information systems will, too, in terms of being able to automate integrated solutions. Microsoft standardized on Visual Basic for Applications (VBA) across the primary applications and improved the debugging tools to test VBA program code.

User-friendly

The company also worked hard to make this a good suite for less-accomplished users, and to some degree it succeeded — but not completely. The Office Assistant is a natural-language interface query system that was already fairly good, and it hits appropriate material even more often in this version. Office 97 also adds Bob-like characters to the Office Assistant, so you can have a robot, Albert Einstein or a Windows logo as your "guide."

This certainly will help many of the more easily intimidated users. But intimidation is part of the issue here. There are tons of features in each application. Outlook alone is mammoth (for features and the number of ways to execute them), heavily customizable and unique. It also offers a healthy set of tools for automating processes.

I recommend training for users who haven't used a personal information manager (PIM). Even for those users who have used a PIM, there are enough differences from others that I recommend training for them as well. While the online help, which was incomplete in the beta, is very good, even the best online help and documentation in the world couldn't make this tidal wave of stuff truly easy.

Overall, the suite has taken on some worthwhile features. Web integration is cleaner, although the beta version I tested didn't execute all of it cleanly. An example of what Microsoft plans is a way to let users maintain a Web page as a dynamic data source for an Excel spreadsheet in a tight, easy link. (I couldn't make this work in the beta.) And shortcuts to Web pages are drag-and-droppable throughout.

The intelligent background agents, such as those for spell-checking and grammar-checking, were already pretty effective and convenient. But this version seems even more effective, especially for spelling. The Office Assistant help system's context-sensitivity is state-of-the-art, and Microsoft has added a smart statement builder into the VBA editor so you can code by example.

People are more productive in a suite than in a couple of unintegrated programs they have chosen only if the suite saves them time, reduces the learning curve or provides a dashboard that makes it easier to manage a busy day. Lotus had the swell idea of putting a personal organizer in an office suite, but Microsoft has improved on the concept.

Angus is a systems analyst at The Data Works Ltd. in Seattle.

Testing process for Office 97

Office 97 was tested on a 66-MHz Intel Corp. 486-based machine with a Peripheral Component Interconnect video card and 16M bytes of memory. The beta was slightly better than average for a beta; bugs weren't uncommon, but they couldn't be reproduced. The speed wasn't good, but that isn't a serious issue, if one presumes a normal beta-to-ship improvement. The "typical" installation sucked up 130M bytes of hard drive storage, and a full installation would require close to 150M bytes.

Each application was tested to some degree, and documents were created in each. Outlook 97 was tested extensively as was the way the suite integrated the component applications and the mechanisms for doing that.

MEDICAL ALERT...
Unix Programming Suspect in Wave of Migraine Headaches

Stop beating your head against unusable tools! Instead, use mainframe-style tools on Unix for immediate productivity.

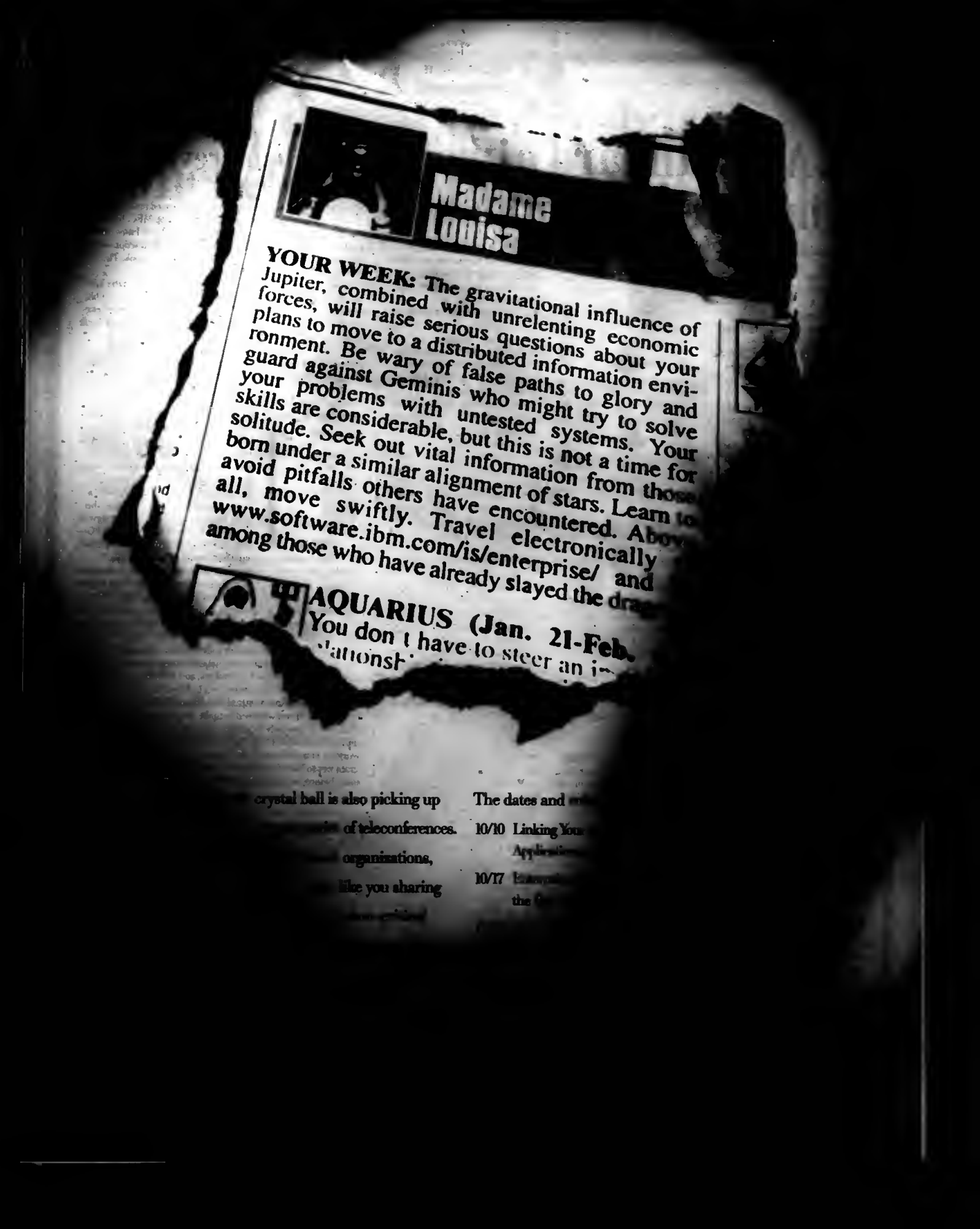
uni-SPF ispf-style Editor, Browse, Utilities, ... even Dialog Mgmt!

uni-REXX Portable System Control and Macro Language

uni-XEDIT cms-style Editor with Full Macro Support

wrk/grp
The Workstation Group

800-228-0255
sales@wrkgrp.com
http://www.wrkgrp.com


Madame Louisa
YOUR WEEK: The gravitational influence of Jupiter, combined with unrelenting economic forces, will raise serious questions about your plans to move to a distributed information environment. Be wary of false paths to glory and guard against Geminis who might try to solve your problems with untested systems. Your skills are considerable, but this is not a time for solitude. Seek out vital information from those born under a similar alignment of stars. Learn to avoid pitfalls others have encountered. Above all, move swiftly. Travel electronically www.software.ibm.com/is/enterprise/ and among those who have already slayed the dra
AQUARIUS (Jan. 21-Feb.
You don t have to steer an i
crystal ball is also picking up
of teleconferences.
organizations,
like you sharing
The dates and
10/10 Linking You
Applicati
10/17
the

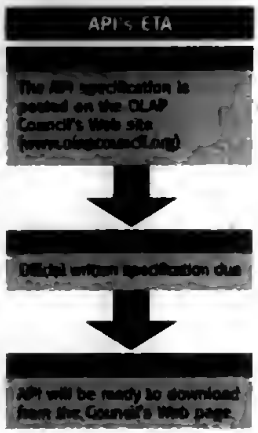
OLAP standard aimed at mixed environments

By Sharon Gaudin

Big businesses with a hodgepodge of online analytical processing (OLAP) database products will welcome a new interoperability standard that debuted recently.

The Boston-based OLAP Council has released the first interoperability standard that will enable companies with mixed OLAP environments to easily access and manage data among different products.

OLAP software was designed for fast analysis of multidimensional data. For example, an OLAP query might ask how the price of soda would change if the price of gasoline rose during the summer months.



Collecting comments

The council is posting the application programming interface (API) specification on its World Wide Web site (www.olapcouncil.org) for a 90-day comment period.

The final written specification is due by December and could start showing up in commercial software products by next April, said council member Rick Crandall, chairman of Comshare, Inc. in Ann Arbor, Mich.

"Anything that will introduce standards is a good thing, even if the standards aren't ideal," said Steve Rubinow, vice president of corporate MIS at Fidelity Investments in Boston.

"We use multiple OLAP products. By book or by crook, there are ways to get data out of one and into another, but it's with very little grace or even brute force," Rubinow said.

"Easier access would make our lives easier and more productive," he said.

Rubinow said Fidelity uses about six different OLAP products because the investment firm has more than 40 business units, and each one decides which product to buy.

"There is no single product on the market that can solve all the needs of any business," he explained. Brian Murphy, an analyst at The Yankee Group in Boston, called the API the Holy Grail of the OLAP industry.

"The members of the OLAP Council used to be a bunch of squabbling children, and it hurt them," Murphy said.

"They realized there was enough business for everyone, and it would be in everyone's benefit to have some level of consistency in what in many respects are alien technologies to each other," Murphy said.

Having doubts

But Murphy said he doubts that all the vendors will "play nice," even with the API.

"Everyone will make nice to each other's face and adhere to the standard, but they'll also add something to differentiate themselves. And because of those little add-ons, it's not going to be a trivial undertaking to move from one of these vendors' technologies to the other," Murphy said.

New Products

SES, Inc. has added software architecture support to its SES/Code Genesis object-oriented code-generation product.

According to the Austin, Texas, company, SES/Code Genesis now generates custom code for the PSOS operating environment for embedded systems.

SES/Code Genesis, including the PSOS software architecture, costs $29,000.

▶ *SES*
(512) 328-5544
www.ses.com

Infinite Pictures, Inc. has launched SmoothMove Panorama Pro Software Development Kit, a tool kit for adding spherical panoramic images to multimedia applications.

According to the San Francisco company, the kit is the only tool to provide interfaces to a C++ application program interface and Macromedia, Inc.'s Director authoring software. It was designed to provide smooth navigation with images and three-dimensional models.

The kit costs $249.

▶ *Infinite Pictures*
(503) 221-2449
www.smoothmove.com

NCR Corp. has announced enhancements to Top End, its transaction request broker.

According to the Dayton, Ohio, firm, the changes enable almost instant programming over networks to shorten development time.

Java and ActiveX remote clients are free and are available at the NCR World Wide Web site. Top End software starts at $2,700 per server.

▶ *NCR*
(513) 445-5000
www.ncr.com

Integrated Computer Solutions, Inc. has announced Builder Xcessory Pro, an integrated suite of products for visual object-oriented development.

According to the Cambridge, Mass., firm, the product supports Java and C/C++ development. A one-year license costs $6,495.

▶ *Integrated Computer Solutions*
(617) 621-0060
www.ics.com

Glassco Park, Inc. has released FinancialCAD Solution Developer for in-house informatioo technologists who build financial systems.

According to the Surrey, British Columbia, firm, the product includes Financial CAD for Excel and systems development tool kits for Microsoft Corp.'s Visual Basic and C.

A license costs $2,495.

▶ *Glassco Park*
(604) 572-3682
www.financialcad.com

MFC book reviews

CONTINUED FROM PAGE 49

ence that is written in clear language and geared toward Windows 95 programmers who want or need to use MFC. It assumes "at least a rudimentary knowledge of C++." If "you know how to derive a class and you understand what a virtual function is, you know most of what you need to know to read this book. The rest you can pick up as you go along."

Topics include how to get input from the mouse and the keyboard, menus and controls, timers and idle processing, and bit maps and threads. The CD-ROM includes source code and executables for all the book's sample programs. This is a good book for every MFC programmer to have on his bookshelf.

***Extending the MFC Library* by David A. Schmitt. Addison-Wesley Longman, Reading, Mass.; 352 pages, $32.95 with CD-ROM.**

How can you not relate to a guy who starts his book with a tale about how his "poor, tired brain" was about "ready to explode" — and then he discovered MFC and C++ just in time to finish a project for a client on time, natch. "As a long-term C programmer, I had always resisted C++ because it didn't seem to offer much," Schmitt writes. But MFC gave him "a new reason to learn the language," he says. The book provides an overview of C++ — the better to understand MFC — and definitions of terms such as classes and libraries. Most of what Schmitt writes in this chapter can be understood by mere mortals, and from here, he gets much more in depth about how to use and optimize MFC. Much of the remainder of the book is less basic than the opening chapters. Topics include the MFC print engine, extending the application class and using tabbed dialogs. The CD-ROM includes project code packaged as a class library; InstallShield Express Lite, a visual environment for creating installations for Windows applications; and a Word 6.0 template.

Extending the MFC Library *tells how to use tabbed dialogs*

This book was written before MFC 4.0 was available and, so, doesn't cover it. And if you are an MFC newbie, it isn't clear that this book is all you will need to make the jump to MFC and C++. That isn't necessarily a criticism; one book can cover only so much ground effectively. But to the extent that MFC requires a working knowledge of C++, it may not be a bad idea for a C programmer to have fooled around with object-oriented programming before picking up this book. *—Johanna Ambrosio*

Java

CONTINUED FROM PAGE 49

tional Semiconductor Corp. in Santa Clara, Calif. "They're not working on one big program that needs five man-years of work in two months to get done."

Java's ability to organize projects avoids a typical problem with rapid-development tools such as PowerBuilder and Microsoft Corp.'s Visual Basic: Those applications can be built quickly, but they are a tangle of badly organized code beneath the surface.

That can create a need for special tools to manage team development.

"Most visual packages are graphically oriented. They help generate a lot of code fast, but you get into spaghetti code real quick if you're not careful," said Mark Mendenhall, a software engineer at PRB Associates, Inc. in Camarillo, Calif.

But some lack of enthusiasm for big Java teams may simply reflect the early stage of Java use by corporate developers. Many corporate information systems shops have waited to jump on the Java bandwagon because Java visual development tools have been slow to arrive. Symantec and Rogue Wave Software, Inc. in Corvallis, Ore., are shipping drag-and-drop Java environments. But other development tool vendors that have promised visual Java tool sets haven't delivered yet.

Update your database whenever you dial into e-mail.

(Now the only hard part is finding the phone jack.)

The easiest path to data replication on the road these days? E-mail. Thanks to SQL Remote,™ a remarkable feature of Sybase SQL Anywhere.™

Using any popular e-mail platform, SQL Remote enables database updates to occur bi-directionally, simultaneously and transparently.

How? SQL Remote tracks changes in your local database and bundles them as e-mail messages. When you dial in for e-mail, changes are fired off to the head office system. Updates at the consolidated database are returned to your local database. The result? Perfect replication.

The same principle provides a Mobile Intranet.

SQL Anywhere Professional™ stores HTML pages from your corporate web site to its database at both the consolidated and local ends. After an e-mail exchange, your corporate URL (accessed locally and completely off-line, if you wish) displays all pages. All updates. All revisions.

No other database and replication package keeps you so easily and completely in sync with corporate data. From anywhere. Found that phone jack?

[redacted]

SYBASE®
www.sybase.com

© 1996 Sybase, Inc. Sybase, SQL Remote, SQL Anywhere, and SQL Anywhere Professional are trademarks of Sybase, Inc. All other trademarks are property of their respective holders. Outside the U.S., call 1-508-287-1500. Code 4650.

You love it when this happens. It just never seems to happen enough.

©1996 EDS. EDS is a registered trademark and CoSourcing is a service mark of Electronic Data Systems Corporation

A CoSourcing℠ relationship with EDS is about creating extraordinary business results.

Results, as in 1+1=3.

It's also about us being accountable for improving your business performance. We—and our colleagues at our management consulting arm, A.T. Kearney—help you set measurable business goals and develop strategies to achieve them. Then, through the innovative use of information and technology, we work with you to implement those strategies. EDS follows every endeavor through to its end, from strategic planning to the final realization of your business goals. And we've got plenty of examples of that.

Working with EDS, Saab cut the time it took to build a car in half, and quality improved measurably. And a company called First Virtual devised a safe way for shoppers to use plastic over the Internet.

EDS CoSourcing relationships work. We're so sure of it, we'd like to discuss tying part of our compensation to how successful we are at helping you improve your business.

To learn more, contact us at 1-800-566-9337 or at info@eds.com. Or visit us at http://www.eds.com.

▶ A more productive way of working EDS

The Enterprise Network

Dodging 'net saturation

New IP standard will ease addressing crunch

By Patrick Dryden

Just as systems and applications programmers must fix date fields before the year 2000, network administrators must make plans to upgrade the Internet Protocol.

A new version of the protocol expands IP address space fourfold, boosting the number of possible addresses exponentially. This will have significant impact on corporate TCP/IP networks, intranets and Internet use.

Arizona State's Joe Askins *says the transition to IPV6 is still hazy*

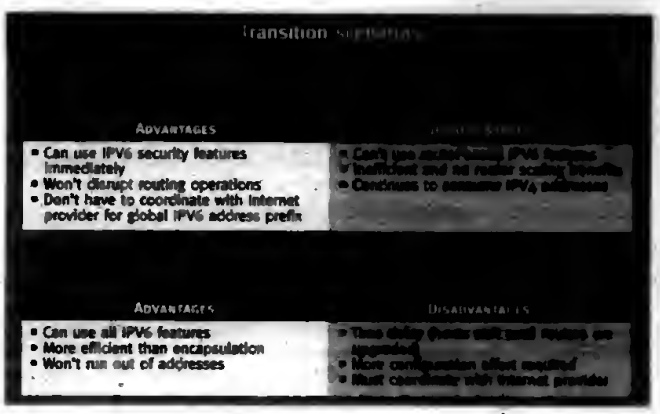
The Internet Engineering Task Force is refining IP Version 6.0 (IPV6), which is expected next year in products. The new version includes ample space for network node addresses, which will allow almost unrestricted growth in the size of the Internet, make routing more efficient and guarantee service quality and security.

"The whole industry is finally worrying about running out of address space," said Allen Gwinn, associate director of computing in the business information center at Southern Methodist University in Dallas. "We need to quit talking about IPV6 and start playing with it before all internetworking suffers."

Primer: IPV6

Right now, the base specification for IPV6 is at the first of three steps on the path to standardization, and the portion defining routing methods should join it soon, according to Bob Gilligan, a chairman of

IP, *page 56*



Is your E-mail worthy? Software will be the judge

By Tim Ouellette

The IS department for the Boots the Chemists Ltd. chain of pharmacies in the U.K. isn't Big Brother.

But information systems staffers want to read all the electronic mail going to Boots' 1,200 store managers.

To do that, Boots will run new Action Gatekeeper software from Park City Group that checks E-mail before it travels across the network. It can delay delivery or even return mail to the sender undelivered if the message carries unauthorized information or is for nonbusiness purposes.

That could reduce costs by keeping the network free of nonbusiness E-mail and save work time by giving readers a prioritized list of incoming messages.

Announced this week, Action Gatekeeper holds promise for companies such as Boots that want to limit personal and junk E-mails across their networks and enforce standard communications policies.

"The critical factors are a message's content, the width of distribution across our network and the priority placed on it," said

Gatekeeper, *page 56*

Sam Ogozalek

Ethernet beats ATM on desktop

By Bob Wallace

Despite recent industry hype, switched Ethernet is blowing the doors off 25M bit/sec. ATM on the desktop.

Although 155M bit/sec. Asynchronous Transfer Mode (ATM) is continuing its steady growth as a backbone technology, 25M bit/sec. ATM — designed to bring larger pipes to the desktop — is losing out in favor of switched Ethernet.

These 25M bit/sec. ATM products have been shipping for two years.

The reasons users haven't widely implemented 25M bit/sec. ATM are that it is more expensive than alternatives such as switched Ethernet, requires changes at the desktop and usually requires staff training.

Desktop networks

Switched Ethernet doesn't require retraining, and it gives information systems managers a way to boost the performance of bandwidth-demanding client/server applications.

Some users and analysts don't yet see a business advantage to 25M bit/sec. ATM.

Revenue from Ethernet switches will grow from $664 million this year to $1.5 billion in 1999, according to a forthcoming report from The Yankee Group in Boston.

Revenue from sales of ATM switches, which will total $41 million this year, will skyrocket in percentage terms but will top out at just $165 million in 1999, according to the report.

There is a reason for that trend.

"Switched Ethernet requires no equipment change at the desktop and provides more bandwidth than most desktops can use right now," explained Ron Rimmer, network manager for the information systems unit at Wake Forest University in Winston-Salem, N.C. "ATM [at 25M bit/sec.] will become an option in the future, but since it's a newer and different technology than Ethernet, it's another skill set my staff would need to learn."

If the bulk of your network isn't ATM, opting for 25M bit/sec. ATM can complicate things. ATM cells from the desktop would, for example, need to be translated into packets for transmission over non-ATM campus backbone networks. That is a problem because software is needed to handle the conversion process.

But many users are doing the opposite: running switched Ethernet to the desktop and loading that onto ATM backbone networks.

"We're in the process of going with switched Ethernet to every desktop on our corporate campus and feeding that traffic into switches with ATM uplinks," said Chuck Rush, global

ATM, *page 56*

The Enterprise Network

Dodging 'net saturation

New IP standard will ease addressing crunch

By Patrick Dryden

Just as systems and applications programmers must fix date fields before the year 2000, network administrators must make plans to upgrade the Internet Protocol.

A new version of the protocol expands IP address space fourfold, boosting the number of possible addresses exponentially. This will have significant impact on corporate TCP/IP networks, intranets and Internet use.

Arizona State's Joe Askins *says the transition to IPV6 is still hazy*

The Internet Engineering Task Force is refining IP Version 6.0 (IPV6), which is expected next year in products. The new version includes ample space for network node addresses, which will allow almost unrestricted growth in the size of the Internet, make routing more efficient and guarantee service quality and security.

"The whole industry is finally worrying about running out of address space," said Allen Gwinn, associate director of computing in the business information center at Southern Methodist University in Dallas. "We need to quit talking about IPV6 and start playing with it before all internetworking suffers."

Primer: IPV6

Right now, the base specification for IPV6 is at the first of three steps on the path to standardization, and the portion defining routing methods should join it soon, according to Bob Gilligan, s chairman of

IP, *page 56*

Transition scenarios

Upgrade hosts one by one, then routers

Requirements: At least one Domain Name Server supporting quad-length host record; hosts configured to use IPV4-compatible addressing scheme; tunneling

Advantages	Disadvantages
• Can use IPV6 security features immediately • Won't disrupt routing operations • Don't have to coordinate with Internet provider for global IPV6 address prefix	• Can't use router-based IPV6 features • Inefficient and no router scaling benefits • Continues to consume IPV4 addresses

Upgrade routers first, then hosts

Requirements: Dual IP support in each router for parallel routing; global IPV6 address prefix from Internet service provider; link site IPV6 routing with backbone

Advantages	Disadvantages
• Can use all IPV6 features • More efficient than encapsulation • Won't run out of addresses	• Time delay (hosts wait until routers are upgraded) • More configuration effort required • Must coordinate with Internet provider

Is your E-mail worthy? Software will be the judge

By Tim Ouellette

The IS department for the Boots the Chemists Ltd. chain of pharmacies in the U.K. isn't Big Brother.

But information systems staffers want to read all the electronic mail going to Boots' 1,200 store managers.

To do that, Boots will run new Action Gatekeeper software from Park City Group that checks E-mail before it travels across the network. It can delay delivery or even return mail to the sender undelivered if the message carries unauthorized information or is for nonbusiness purposes.

That could reduce costs by keeping the network free of nonbusiness E-mail and save work time by giving readers s prioritized list of incoming messages.

Announced this week, Action Gatekeeper holds promise for companies such as Boots that want to limit personal and junk E-mails across their networks and enforce standard communications policies.

"The critical factors are a message's content, the width of distribution across our network and the priority placed on it," said

Gatekeeper, *page 56*

Ethernet beats ATM on desktop

By Bob Wallace

Despite recent industry hype, switched Ethernet is blowing the doors off 25M bit/sec. ATM on the desktop.

Although 155M bit/sec. Asynchronous Transfer Mode (ATM) is continuing its steady growth as s backbone technology, 25M bit/sec. ATM — designed to bring larger pipes to the desktop — is losing out in favor of switched Ethernet.

These 25M bit/sec. ATM products have been shipping for two years.

The reasons users haven't widely implemented 25M bit/sec. ATM are that it is more expensive than alternatives such as switched Ethernet, requires changes at the desktop and usually requires staff training.

Desktop networks

Switched Ethernet doesn't require retraining, and it gives information systems managers a way to boost the performance of bandwidth-demanding client/server applications.

Some users and analysts don't yet see s business advantage to 25M bit/sec. ATM.

Revenue from Ethernet switches will grow from $664 million this year to $1.5 billion in 1999, according to a forthcoming report from The Yankee Group in Boston.

Revenue from sales of ATM switches, which will total $41 million this year, will skyrocket in percentage terms but will top out at just $165 million in 1999, according to the report.

There is s reason for that trend.

"Switched Ethernet requires no equipment change at the desktop and provides more bandwidth than most desktops can use right now," explained Ron Rimmer, network manager for the information systems unit at Wake Forest University in Winston-Salem, N.C. "ATM [at 25M bit/sec.] will become an option in the future, but since it's s newer and different technology than Ethernet, it's another skill set my staff would need to learn."

If the bulk of your network isn't ATM, opting for 25M bit/sec. ATM can complicate things. ATM cells from the desktop would, for example, need to be translated into packets for transmission over non-ATM campus backbone networks. That is s problem because software is needed to handle the conversion process.

But many users are doing the opposite: running switched Etherhet to the desktop and loading that onto ATM backbone networks.

"We're in the process of going with switched Ethernet to every desktop on our corporate campus and feeding that traffic into switches with ATM uplinks," said Chuck Rush, global

ATM, *page 56*

Briefs

3Com reorganizes

The nation's No. 2 networking equipment company, 3Com Corp., has reorganized into two divisions — 3Com Systems, which targets high-end corporate clients, and 3Com Personal Products, aimed at consumers and small businesses. The move is meant to better position 3Com to compete against chief rival, Cisco Systems, Inc., which holds the No. 1 slot and dominates the corporate market.

Kaspia, the friendly network ghost

Kaspia Systems, Inc. has introduced an automated network performance monitoring suite that acts like a smoke detector to give managers early warnings of problems. The start-up in Beaverton, Ore., is delivering the Kaspia Monitoring System as promised (CW, Aug. 5). Pricing starts at $6,000 for the Windows-based software, which polls managed devices throughout a network and presents daily reports accessible via a World Wide Web browser.

Compaq to push small-business LANs

Compaq Computer Corp. in Houston is aiming at the small-business market with a starter kit that makes LANs easy to set up. The Compaq GroupWise starter kit will be provided free to customers who purchase from Compaq 5-, 10- or 25-user licenses for Novell, Inc. NetWare 4.1. GroupWise, Novell's groupware product, is included in the package. Compaq, which has large market share in the Fortune 500 and consumer markets, has begun to target small and medium-size businesses. The program will be available through the end of the year, Compaq said.

Wireless connections

AT&T Wireless Services and Cellular One are linking their wireless data networks. The agreement calls for the two companies to share Cellular Digital Packet Data services, or wireless IP, in 30 markets stretching from Tampa, Fla., to Portland, Ore. It is the third such agreement for AT&T Wireless Services, which already has deals with Ameritech Cellular for the upper Midwest region of the country, and Bell Atlantic Nynex Mobile for the Atlantic seaboard.

Giga to ship fat pipe

GigaLabs, Inc. in Sunnyvale, Calif., has announced a pair of scalable LAN switches with a key differentiating feature — a 1G bit/sec. "fat" pipe that gives users access to high-speed servers. While most LAN switches offer 100M bit/sec. Fiber Distributed Data Interface, 100M bit/sec. Fast Ethernet or 155M bit/sec. Asynchronous Transfer Mode uplinks, the 1G bit/sec. connection offers bulk bandwidth for the most heavily used, data-intensive applications. The vendor's GigaStar 100 provides switched Ethernet links at roughly $300 per port, while the larger GigaStar 2000 is a data center switch. For a limited time, firms that spend $15,000 or more on a GigaStar 100 get the $15,000 chassis of the larger GigaStar 2000 free. Both will ship late next month.

IP upgrade

CONTINUED FROM PAGE 55

the Internet Engineering Task Force's working group for IPV6.

Although details may change, the IPV6 specification is solid enough that network managers should be able to evaluate its benefits next year, Gilligan said. Major vendors already are implementing IPV6 support in host operating systems and services and router products, he said.

"We heard a lot of talk about IPV6 at Networld/Interop recently but no clear idea how it will be thrust on users and the Internet," said Joe Askins, director of data communications at Arizona State University in Tempe.

Slow and steady

The good news is that change will be evolutionary, allowing network managers to apply IPV6 where and how it is most urgently needed without disrupting existing networks, Gilligan said.

Systems will interoperate through various transition mechanisms. These include supporting old and new IP versions (parallel routing), encapsulating new IP information for delivery via the old version (tunneling) and combining old addresses with new ones. But administrators and applications such as network monitoring and mapping tools must adapt to a new address format. The familiar dotted decimal address will be replaced by eight fields in hexadecimal notation separated by colons.

"We're concerned about this version's impact on network management," said Scott Parker, supervisor of Unix and networking support at Turner Broadcasting System, Inc. in Atlanta.

To improve routing efficiency, the bigger address adds hierarchy levels. This helps reduce the size of the swollen routing tables that internetworking devices maintain, thereby reducing the demand for router processing.

Built-in security functions include authentication and packet encryption. But implementing them will require a standard encryption chip or software.

Not only does IPV6 demand planning, but Askins said he hears confusing and conflicting pitches from vendors and standards groups. They tout the ability to replace routers with switches, carry multiple protocols over Asynchronous Transfer Mode circuits and adapt IP to switches, among other possibilities.

"It's tough to keep a big network running and make sense of all the new technologies that promise to help," Askins said.

IPV6 will increase reliability

A victim of its own success, the Internet is running out of available addresses.

Approximately 10 million nodes populate the Internet now, and an unknown number spring up on corporate intranets daily. This growth may have to halt at around 2006 — give or take five years — due to inefficient allocation of addresses and growth that doubles size yearly.

That's the latest projection by the Internet Engineering Task Force (IETF), which is dealing with the situation.

Also, router technology probably can't keep up with runaway growth much longer, according to the IETF projection. So far, routers have been able to compensate for the ever-increasing size and complexity of routing tables through higher performance.

To prevent disaster, IETF has defined an upgrade of the Internet Protocol (IP), the network-layer mechanism for addressing and controlling how and where data packets are routed across an internetwork. Dubbed IPV6, this next-generation IP expands the current IP Version 4 address space from 32 to 128 bits.

That size increases the amount of routing information a data packet can carry, expanding the number of possible nodes, making routing more efficient, enabling delivery of time-critical data and securing transactions on an open network. — *Patrick Dryden*

Gatekeeper

CONTINUED FROM PAGE 55

Gary Flood, a manager in Boots' IS department in Nottingham, England.

Boots plans to flag messages with large distribution lists to make sure they really need to take up that much bandwidth. In the long term, the company will focus on messages with improper content, Flood added.

E-mail management

Action Gatekeeper targets retail organizations that use the Park City, Utah, firm's Action Manager line of retail workflow automation software. But observers say controlling the flow of E-mail based on content, sender and message type has appeal beyond retail organizations.

"Now we can have E-mail for businesses where you really need to be very concerned about communication policies," said Geoffrey Bock, an analyst at Patricia Seybold Group in Boston. Another reason is because some companies are simply leery of setting users free with a general E-mail package, he added.

For example, if someone tries to distribute a message with confidential financial data to a large group of users, Action Gatekeeper could stop the message cold if the user doesn't have the right clearance or if the data shouldn't be released until a later date.

Action Gatekeeper depends on a structured set of roles and rules built in to the ActionManager suite of software modules, which includes E-mail. Each user has a set role as store manager, division head and so on, and each type of E-mail may have rules about the times that a certain type of data can be released, for example.

Businesses can use Park City's Action Gateway to tie LAN-based E-mail systems such as Lotus Development Corp.'s CC:Mail and Microsoft Corp.'s Mail into the monitoring process.

"There is no precedent for a product like this," said George Thompson, a staff member at the Electronic Messaging Association in Arlington, Va. "Companies should have an E-mail policy in place that treats E-mail the same as it does faxes, paper memos and phone usage."

Porting such control from a retail environment to general E-mail could take some doing. "The kinds of general rules you would need to apply [to other markets] would be a lot less specific," said Ezra Gottheil, an analyst at Hurwitz Group, Inc. in Boston.

Products such as Notes and Exchange allow users to create rules to automatically forward messages or other simple tasks, but none go as far as to review the actual content of the message. Rules are also most often prepared by the users themselves, not the IS department.

Action Gatekeeper will be available next month for $6,000.

ATM losing out to Ethernet

CONTINUED FROM PAGE 55

network architect at McDonald's Corp. in Oakbrook Terrace, Ill. "ATM to the desktop didn't make any sense because of the adapter card change. If you're going to make a change there, why not go to a 155M bit/sec. card. We view [25M bit/sec. ATM] as a dead-end technology."

Easy Ethernet

The majority of desktops today share 10M bit/sec. of Ethernet bandwidth. When users need a performance boost, most turn to dedicated bandwidth at 10M bit/sec. from Ethernet switches, which cost as little as $200 per port.

However, an upgrade to ATM isn't as easy or cheap. It requires IS managers to install 25M bit/sec. ATM adapters in PCs, at a few hundred dollars per machine, plus ATM switches cost another $300 or so per port.

"ATM at 25 has to become ATM at 155 to succeed," said Eric Hindin, a senior program director at The Yankee Group "Even if the price point was driven down to switched Ethernet, there's just not enough value added [beyond switched Ethernet] for users to go with ATM. It's not a mainstream technology."

Get on the fast track.

#1 IN DATA WAREHOUSING

Get your free copy of
Data Warehousing: Factors for Success.
Visit our web site at www.ncr.com/service/addw or call toll-free
1-888-NCR-7111, ext. 25. Or complete and mail this card.

Name_____
Title_____
Company_____
Address_____
City_____ State _____ Zip_____
Phone_____ Fax_____

CW

NCR

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST-CLASS MAIL PERMIT NO 16 FRAMINGHAM, MA

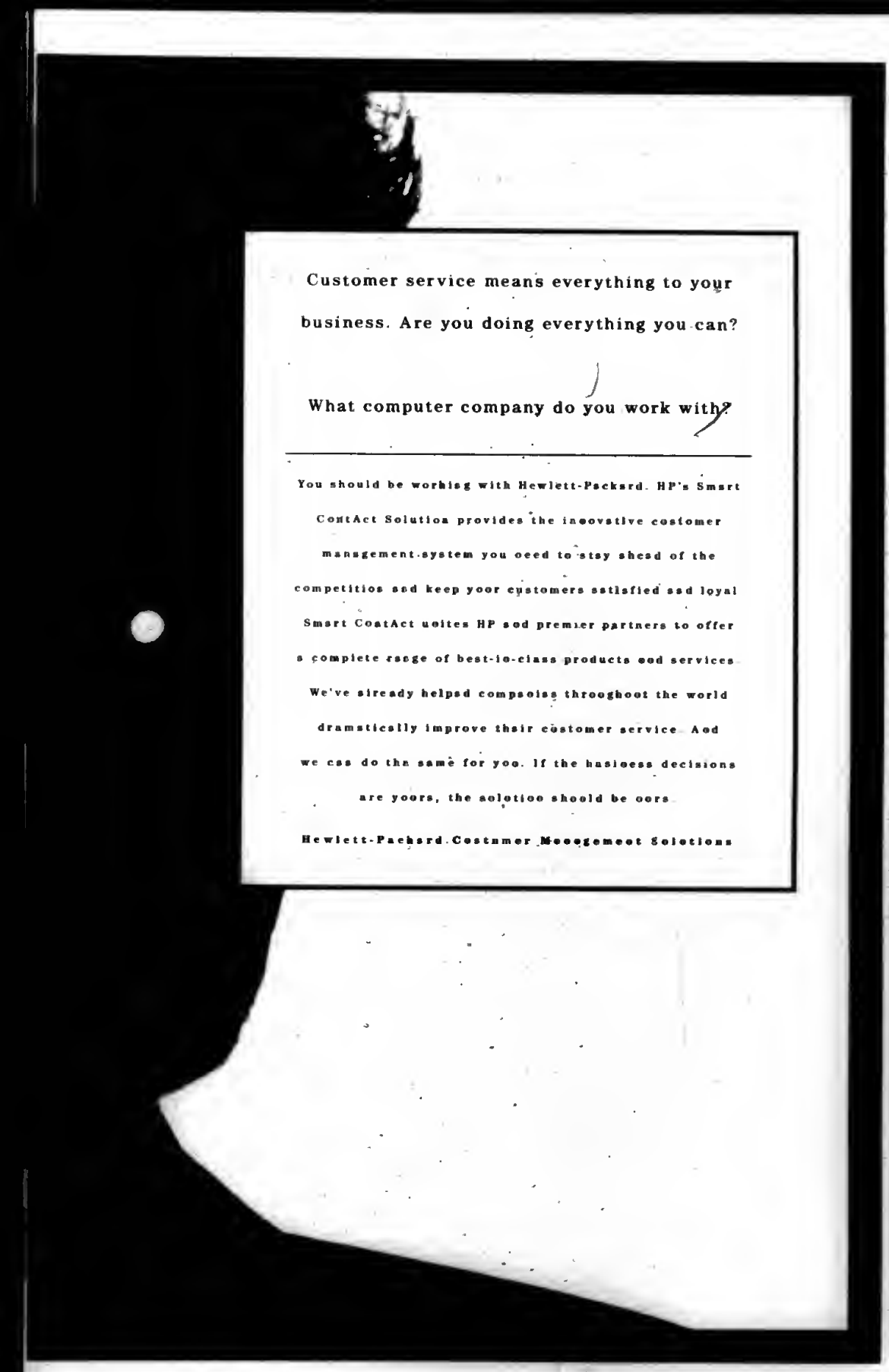
POSTAGE WILL BE PAID BY ADDRESSEE

Peter Boulter, Director of Marketing
NCR Worldwide Services
PO Box 9345
Framingham, MA 01701-9653

#1 IN DATA WAREHOUSING

NCR

© 1998 Hewlett-Packard Company



Customer service means everything to your business. Are you doing everything you can?

What computer company do you work with?

You should be working with Hewlett-Packard. HP's Smart ContAct Solution provides the innovative customer management system you need to stay ahead of the competition and keep your customers satisfied and loyal. Smart CoatAct unites HP and premier partners to offer a complete range of best-in-class products and services. We've already helped companies throughout the world dramatically improve their customer service. And we can do the same for you. If the business decisions are yours, the solution should be ours.

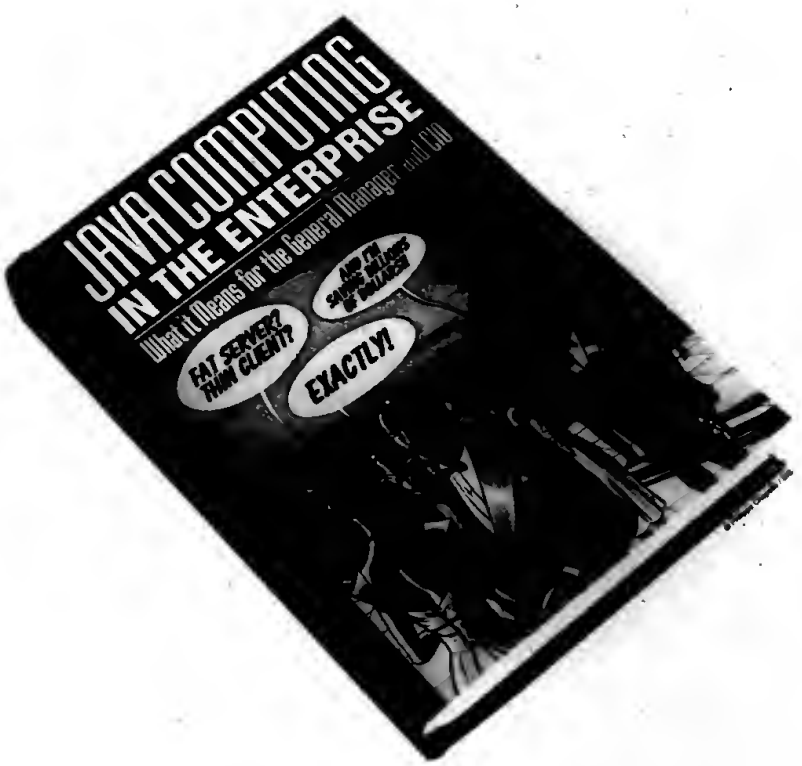
Hewlett-Packard Customer Management Solutions

HEWLETT® PACKARD

"Riveting...

...a whitepaper like this comes along only once in a paradigm."

—The Java™ Journal



A WHITEPAPER ON THE FUTURE OF NETWORK COMPUTING. SERIOUSLY.

WWW.SUN.COM/JAVACOMPUTING
ALSO AVAILABLE BY CALLING 1-800-786-0785 EXT.460

Sun microsystems

© 1996 Sun Microsystems, Inc. All rights reserved. Sun, Sun Microsystems, the Sun Logo. The Network Is The Computer and Java are trademarks or registered trademarks of Sun Microsystems, Inc. in the United States and other countries.

The Internet

Concentric service offers reliable remote Internet access, 64

In a buyer's market, Web denizens vie for hot domain names

Dueling for domains

By Kim S. Nash

Birth, death and taxes are all taken, but bid high enough and you can still buy the rights to cheapthrills(.com), bloodlust (.com) or even ostrichmeat(.com).

With dollar signs in their eyes, World Wide Web surfers have busily registered what they hope will become lucrative domain names — as either popular Web sites or high-priced items to auction.

The wheeling, dealing and lawsuits have gotten so bad that Network Solutions, Inc., the agency that oversees domain name administration in the U.S., recently rewrote its registration policy for the second time in a year, absolving itself of legal liability when disputes get ugly.

Network Solutions in Herndon, Va., was caught in the middle of spats such as the dispute between Santa Fe, N.M.-based Internet service provider Roadrunner Computer Systems and Time Warner, Inc. over the name roadrunner.com. The computer firm got to keep the name, but at a cost of $50,000 in legal fees.

Earlier this month, Network Solutions said it will no longer mediate such disputes, nor be held responsible in cases where a domain name infringes on a trademark.

Larry Gould

Yet domain name ownership controversies continue, with deals proliferating.

CNet, Inc., the combination Web site and cable channel, recently paid a nonprofit research group $30,000 for tv.com and radio.com.

A Boston-based information systems manager traded boston.com to *The Boston Globe* only after the paper built a Web site for him.

Location, location, location

William Gluck, a lawyer in Manhasset, N.Y., holds the prized taxes.com. "When I get the right partner, I'm looking to capitalize on [the name]. Location is everything," he said.

Also emerging are brokers that buy and sell Web monikers, such as Bestdomains (www.bestdomains.com). Business is good; Bestdomains recently bought out New York rival Brokeragent.

Dennis Buettner, an avid 'net user and database designer at a government contractor in Annapolis, Md., grabbed cigarette.com, cigarettes.com and, just to be safe, the French spelling of the word, cigaret.com.

"I guess you could call me a speculator," Buettner said.

Some would, but others wouldn't be as kind.

"They are scum," said Carl Malamud, president of

Dueling for domains, *page 64*

Putting live audio, video to work on 'net

Real-time multimedia may be fun, but does it have a corporate use?

By Mitch Wagner

It can sing and dance, and it looks real pretty. But can it be made to work for a living?

That's a question users are asking themselves about real-time multimedia over the Internet. For months, entertainment and news sites have been offering radio broadcasts, music samples and news interviews over the Internet, using "streaming" audio and video technology.

KPIG Radio *in Freedom, Calif., uses Xing Technology's StreamWorks 2.0 to let Web visitors listen to live broadcasts*

Now, users face an onslaught of multimedia announcements from vendors, including Microsoft Corp., Oracle Corp. and Lucent Technologies, Inc. (see story, page 64). The vendors claim the Internet is ready for corporate use of real-time multimedia technology — from interactive catalogs that can be viewed by potential customers to training videos that can be downloaded by employees and Internet telephones that can carry two-way phone conversations over the 'net.

But most corporate users aren't convinced that Internet multimedia is ready for serious business applications.

"The technology is not quite there yet," said Matt Blumberg, a product manager at MovieFone, Inc. in New York, which has a nationwide movie theater directory on the World Wide Web.

Despite their concerns about its practicality, information systems managers seem fascinated by real-time multimedia. At Internet trade shows, the booths for video and audio technologies are generally packed with eager observers.

"There's a phenomenal amount of stuff you could do with video," said Jamison Scott, manager of marketing and administration at Air Handling Systems in Woodbridge, Conn., which has an Internet site to sell parts for cleaning the air in industrial sites.

One obstacle to the prevalence of real-time multimedia on the Internet is bandwidth, experts said. The Internet is already suffering slowdowns, and heavy multimedia traffic would add to the burden.

The real-time multimedia market on the Internet is broken in-

Live audio, *page 64*

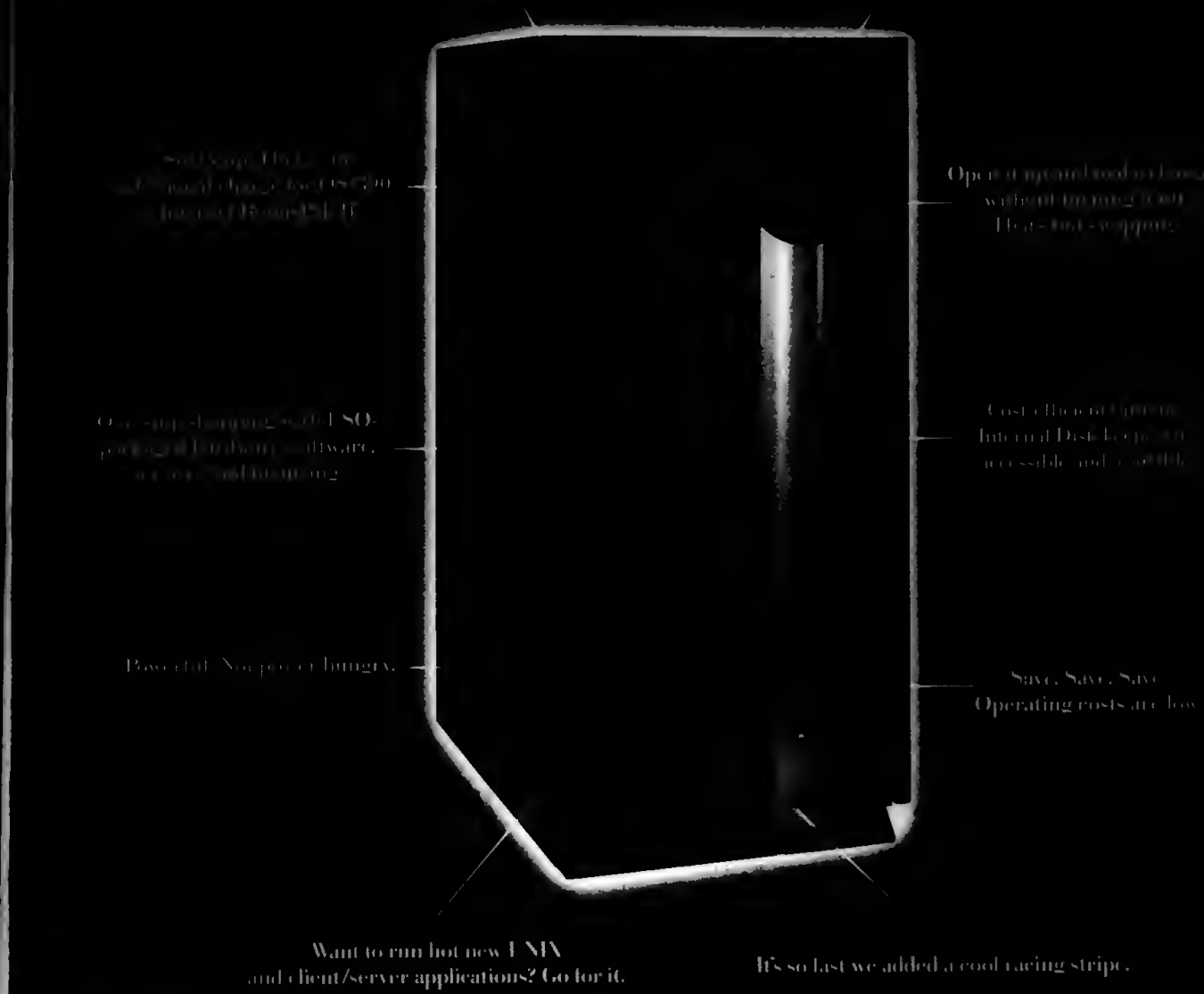
Briefs

Embedded Shockwave

Netscape Communications Corp. in Mountain View, Calif., recently announced it is doing away with **Macromedia, Inc.**'s Shockwave application as a plug-in. The company instead will embed the popular multimedia capability into future releases of the Navigator World Wide Web browser. Shockwave is used to view multimedia applications on Web pages. Netscape also agreed to embed Macromedia's Fireworks device, a Java-based animation application programming interface, into Navigator.

Bundled Explorer

Frontier Technologies Corp., a Web server maker in Mequon, Wis., said it will distribute **Microsoft Corp.**'s Internet Explorer Web browser for free with its Intranet Genie suite. Intranet Genie is a set of Windows NT-based Internet access, Web development, Web server and electronic-mail packages. It was designed for users who build small to mid-size intranet applications. Prices start at $2,740 for five users.



The IBM S/390 Multiprise 2000™ looks like it does it all. But there are a few things it doesn't do. It doesn't take up much space, need lots of pampering or require staff to go back to school.

It also doesn't force you to buy a bunch of new software. The S/390 Multiprise server can handle just about whatever you're running now plus the latest UNIX®, client/server and S/390 programs. Even corporatewide LAN data is a simple interface away. And merging onto the superhighway is a breeze with easy transitions to the Internet and intranet. Just sit back and watch business boom. There's an entire family of S/390 Multiprise models ready to make it happen.

What's more, it doesn't consume all your resources: you'll save up to 89% in floor space, 95% in energy costs and

* As compared to the IBM 3090 class processor. Savings may vary depending on configuration. IBM and S/390 are registered trademarks and Multiprise 2000, OS/390 and Solutions for a small planet are trademarks of International Business Machines Corporation. UNIX is a registered trademark in the United States and other countries licensed exclusively through X/Open Company Limited. All other product names are trademarks or registered trademarks of their respective companies. © 1996 IBM Corporation.

Introducing the IBM S/390 Multiprise 2000. It's just as impressive for what it doesn't do.

actually increase performance up to 40%.* So forget special rooms and water cooling; the S/390 Multiprise server can run almost anywhere there's an outlet. And since it's familiar and reliable, your staff can concentrate on finding other ways to improve your business.

Our Entry Server Offering (ESO) packages are a great place to start. They give you pretty much everything you need up front at significant savings: hardware, software, services, maintenance and financing. Allowing your business to do more for less. The new S/390 Multiprise 2000. If you want to be even more impressed, stop by www.s390.ibm.com or give us a call at 1 800 IBM-2468, ext. CA254.

Solutions for a small planet™ IBM.

Concentric service offers reliable remote access

By Mitch Wagner

Have you ever had to stay up late in a hotel room and wrestle with a temperamental dial-up connection to the corporate network?

Concentric Network Corp. thinks it has the answer to your problems. The Cupertino, Calif., Internet service provider has launched an outsourcing program designed to pick up the burden of maintaining a remote access, dial-up network for corporations.

Currently, companies that support a large, mobile population of workers need to maintain banks of modems to let users connect to the corporate network. With Concentric's remote access product, employees instead can connect to Concentric's nationwide Internet backbone, which in turn connects to the corporate network.

Traveling employees and home-office workers will be able to connect via dial-up access, while remote offices can have permanent, high-speed dedicated connections, Concentric said.

Typically, a company with 500 remote users will pay $280,900 per year for the Concentric remote access service, officials said.

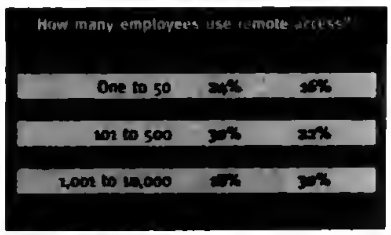
Les Duncan, chief information officer at the women's clothier Express, said the Concentric service might prove beneficial. The company maintains dial-up connections for 50 users.

"Being able to dial for a local connection and coming in through the Internet would be better than the problems we now have with people trying to connect to our remote server," Duncan said. "It's been a hassle."

Concentric faces competition for corporate remote access users. AT&T Corp. and BBN Planet are working on dial-up offerings tailored for corporate users, but neither would provide details on their offerings.

Until now, most dial-up services have been targeted at consumers. Dial-up connections for large companies present some different problems, said John Curran, chief technical officer at BBN. Corporate users require greater security than consumers, for example.

Moreover, business users present more unpredictable demands on a network — winning a single corporate contract can add thousands of users abruptly to an Internet service provider's dial-up network.



Source: Forrester Research, Inc., Cambridge, Mass.

Faster than the 'net

Concentric is continuing its effort to upgrade its network backbone to guarantee fast response — much faster than the bottlenecked public Internet. By the first quarter next year, the firm plans to roll out a network that will enable it to guarantee "latency," or response times, of less than 200 milliseconds for dial-up connections and less than 80 milliseconds for high-speed Internet connections. Currently, response times on the 'net can run into several seconds for coast-to-coast applications — that is, when the applications don't hang outright.

When Concentric announced the plans in the spring, the company was met by much skepticism from technology experts who said 200-millisecond response times would be impossible to maintain. But Concentric maintains that it is using proprietary technology that will do the job. Because the company won't share details about the technology, its claims can't yet be tested.

Vendors float streaming apps

Vendors have been churning out real-time multimedia technology announcements this month, including the following:

- Lucent Technologies is developing servers for multimedia and telephony over the Internet for corporate users. Lucent expects products to be available in the first quarter next year.
- Microsoft announced NetShow server software for delivering multimedia over the Internet. The final release is scheduled to be out by year's end.
- Oracle announced Oracle Video server, due out in the first quarter.

You can sample multimedia technology at the following sites:

- Audio: *Computerworld* offers a daily newsfeed at www.computerworld.com. You can hear music at Warner Bros. Records at www.macromedia.com/shockwave/epicenter/shockedsites/wb/index.html.
- Video: Music, news and technical seminars are available at the Precept Software site at www.precept.com/cgi-bin/ipix/getmulti.gif?843528063. Select live Los Angeles Dodgers videos are at www.dodgers.com/multimedia.html. — *Mitch Wagner*

Live audio

CONTINUED FROM PAGE 61

to several segments. There is real-time audio, led by Progressive Networks Inc., which produces RealAudio. Click on an icon on a Web site, and your browser launches a freeware client application that plays prerecorded or live sound as it is downloaded.

This kind of technology is called streaming. Earlier, non-streaming technology required users to download the entire sound clip — which could take minutes or even hours — before they could play it.

Progressive Networks faces competition from Macromedia, Inc., which launched a streaming audio recording and playback technology in July (CW, Aug. 12).

Like streaming audio, streaming video plays video clips as they are downloaded. Leaders here include VDOnet Corp., VXtreme, Inc., Xing Technology Corp. and Precept Software, Inc. Microsoft and Oracle will presumably also be leaders when their products are introduced.

Vendors argue that factors are just now coming into place to allow the spread of real-time Internet multimedia. The technology previously required expensive, dedicated hardware to play multimedia sounds.

Now, Pentium-class desktop systems can handle decompression and playing data.

Also, corporate users are finally deploying wide-area networks that support multimedia. "Companies are just now getting used to the idea that they can use Web sites and intranet technologies as a way of doing business," said David Oldfield, vice president of marketing at Xing in Arroyo Grande, Calif.

Dueling for domains

CONTINUED FROM PAGE 61

Internet Multicasting Service (IMS).

IMS, the nonprofit organization that sold tv.com and radio.com to CNet, registered the pricey names before the speculation started and used them for legitimate Web sites — not to make a killing, Malamud said. CNet's $30,000 helped fund the Internet World's Fair now happening online, he said.

Domain name dealing is "seamy" and "shows a need for guidance from officials," Malamud said.

Whether the plan is to use a domain name for a real Web site or to sell it, registrants must comply with Network Solutions' new rules or face expensive legal fights, said Karen Leisten, a lawyer at Buchanan, Ingersoll in Princeton, N.J.

Beo Jones, an Internet entrepreneur in Vandalia, Ohio, once owned 20 names that he thought he could sell to a big company. But that was before Walt Disney Co. knocked, wondering what Jones was doing with magickingdom.com.

Disney didn't sue; Jones won't say what happened. But he turned over a new leaf after the encounter and gave up the whole lot, including luckystrike.com and kentuckyderby.com.

"Those names are protected. It was stupid of me," Jones said.

But some observers said the shenanigans are as American as motherhood and apple pie.

Talk to Chicago 'net entrepreneur Mary Rasmmusen about applepie.com, but motherhood is up for grabs.

How to avoid domain disputes

1. Make sure no one else holds a trademark on your domain name
2. Enforce your own trademarks
3. Keep up domain name registration payments

Death.com

Some domain name holders don't plan to sell out. Death.com owner Jayme Cox **said he "just thought it was cool"** to register the grim name. **"Actually,"** Cox added, **"I use my reality.net a lot more."**

New Products

Taxware International, Inc. has announced On-Line Tax Calculator for corporate World Wide Web sites.

According to officials at the Salem, Mass., company, the calculator will look up rates and calculate sales tax for any taxing jurisdiction in the U.S.

On-Line Tax Calculator is available at Taxware International's Web site for free. Taxware International's Internet Tax System is available for $7,500 per year.

▶ *Taxware International*
(508) 741-0101
www.taxware.com

Novell, Inc. has launched GroupWise 5 Mail Box, an extended client/server electronic-mail system.

According to officials at the Orem, Utah, company, GroupWise 5 was designed to give full document management capabilities with a Universal Mail Box. This gives users one point of access to voice mail, faxes and other messages from the desktop and the Internet with GroupWise WebAccess.

Company officials said pricing for GroupWise 5 Mail Box starts at $718 for a five-user license.

▶ *Novell*
(801) 429-7000
www.novell.com

CIOs in the U.K. see outsourcing as a must, 69

Corporate Strategies

'net recruiting shortens search

By Julia King

Kristina Klein was already working between 45 and 50 hours per week when she began searching for a new job in high-tech marketing. There was little time for trolling the classifieds and even less for going out on interviews.

Irene Yao was under time pressures of her own. A program manager at I-Planet, Inc., a software start-up in Sunnyvale, Calif., Yao needed to hire several software engineering, marketing and customer service professionals quickly. She also had a tight budget.

The solution for both women was IntelliMatch (www.intellimatch.com), an Internet-based recruiting service that employs "precision matching technology" to quickly and cheaply pair job seekers with employers.

"When we run a newspaper ad, it costs about $2,000, and most of the responses would not be qualified. With IntelliMatch, we have much more control over who we select [to interview]," Yao said.

I-Planet's Irene Yao: *'With IntelliMatch, we have much more control over who we select'*

Matching up

Using IntelliMatch, employers and job seekers use a structured format to list very specific job requirements and qualifications, including precise details about a candidate's skills and experience. Database administrators, for example, list the database technologies they know and the type and duration of projects on which they have used each.

IntelliMatch then compares the data and provides job hunters and employers with potential leads.

The service is free to job seekers. Employers pay $50 per lead and download an average of 20 leads before hiring an employee.

The database contains about 50,000 resumes, a number that increases at a rate of between 10,000 and 15,000 resumes per month. About 100 employers, including Hewlett-Packard Co. and Candle Corp., subscribe to the service to list jobs and search for employees.

But IntelliMatch isn't just for software companies that want to hire information systems professionals.

Other users include Pfizer, Inc. in New York and HealthStaf in Oak Brook, Ill., which use the database to find sales, marketing, administrative and health care professionals.

IntelliMatch also sells an intranet version of the software so employers can internally keep track of employees' skills and match them to various projects.

"What we do best is create a shortlist of candidates," which works to significantly

'net recruiting, *page 69*

Zoo aims for Web links

Plans also set to upgrade animal management system

By Kim Girard

Apelions roar, seals bark and rare birds chirp, employees at the San Diego Zoo communicate in a much quieter fashion.

On a shoestring budget, Hank Erb, the zoo's information systems manager, has managed to build a humming campus network at this nonprofit organization — which 11 years ago had just one IBM PC.

Erb has succeeded partly by proposing one large project a year and often dividing work over a three-year span. His task? To link the main zoo site in San Diego to several satellite offices, including the zoo's secondary attraction, the 1,800-acre Wild Animal Park 30 miles away in Escondido, Calif. At the animal park, the animals roam free in a fenced-in environment, and visitors can observe them while taking monorail tours.

Erb's fiber campus network — which uses a Token Ring Ethernet setup — links 375 PCs to Novell, Inc. NetWare servers.

The system enables zoo employees at all ends of the network to access animal records, peruse information about the zoo's 220,000 members, gather employee and budget data and examine attendance records.

Three T1 lines are used on the network, including a link from a retail warehouse that houses zoo merchandise to the zoo's administrative offices. A $1,200-per-month, 24-channel T1 line installed to link the zoo to the animal park cleared up a historical voice quality problem between the two sites. Erb said he would like to become more involved with network management and monitoring the zoo's T1 lines by adding new equipment. Several future projects include recording on CD-ROM hundreds of thousands of animal records that date back to the zoo's founding 80 years ago.

The San Diego Zoo *plans to deploy 'net-connected video cameras so volunteers and visitors can monitor animals remotely*

System revamp

The zoo also is revamping its animal management system, which runs on an IBM AS/400. The system, created in the 1980s, tracks animal inventory, including individual names, parents, birth dates and markings.

A new system — now in the planning stages — will have an easy-to-use graphical interface and will integrate records from the zoo hospital on the same platform.

Valerie Thompson, the zoo's associate curator of mammals at the zoo and a member of the team plan-

Zoo, *page 69*

Ford project to cut its prototype costs

By Thomas Hoffman

Ford Motor Co. has launched an ambitious computer-aided design (CAD) project that is intended to cut prototype costs by 50%, improve investment efficiencies by 20% to 30% and eliminate half its costly late development changes.

The project that was launched earlier this year is called C3P, or CAD/CAM/CAE and Product Information Management. C3P is based on a blend of CAD and computer-aided manufacturing (CAM) applications Ford installed earlier this year from Structural Dynamics Research Corp. in Milford, Ohio.

Structural Dynamics' CAD/CAM software, which is being integrated with Ford's computer-aided engineering (CAE) modules, is expected to help the nation's No. 2 automaker develop prototypes of cars and trucks faster on computers than by building test models from the ground up.

For example, it used to take two to three months to build, assemble and test a prototype of a car's chassis. Using the C3P technologies, Ford can do all that in less than two weeks, said Richard Riff, a C3P project officer at Ford's Dearborn, Mich., headquarters.

Even though Ford made extensive use of its C3P systems before, the Structural Dynamics system is more "integrated and intelligent" than its homegrown systems, Riff said. For example, the automaker's finance staff and suppliers will be able to access engineering data online more easily. That will help the finance department plan its budgets and suppliers to schedule its shipments more effectively.

Faster rollout

The systems should also propel Ford in the ever-tightening U.S. car and light truck market.

Ten years ago, it took Ford 60 months to develop a new car. Today, the automaker can roll one out in 32 months, which is about 10% faster than General Motors Corp. and one month behind Chrysler Corp., said Michael Ward, an automotive analyst at PaineWebber, Inc. in New York.

Ford, *page 69*

	CAPACITY	SUSTAINED TRANSFER RATE	HEAD LIFE	MTBF
MAMMOTH 8MM	40GB	6MB/sec	16,000 hrs	200,000 hrs
DLT 4000	40GB	3MB/sec	10,000 hrs	80,000 hrs

We're on the Web at http://www.exabyte.com. *2:1 Compression. In North America, call us at 1-800-Exabyte. In Europe call our office in The Netherlands at 31-30-2446800. Or in Asia, call our Singapore office at 65-2716331

©1998 Exabyte Corporation. Exabyte is a registered trademark of Exabyte Corporation. Exabyte Corporation, 1685 38th Street, Boulder, Colorado 80301 USA. Phone (303) 442-4333.

It's okay to take a flyer every once in a while. Makes life more interesting. But not with your tape backup technology. Data today is simply too critical, often irreplaceable.

Exabyte 8mm tape has long been the standard backup solution for mid-range UNIX/PC LAN environments. It's proven, trusted technology, with an installed base of more than one million drives and the endorsement of the world's leading computer manufacturers. And now Exabyte has moved the bar even higher. Our new generation of 8mm tape drives is faster and more reliable than any drive shipping today in the midrange market.

TOM, 34.
NETWORK MANAGER.
BIG-TIME RISK TAKER.
USES DLT INSTEAD OF
EXABYTE 8MM.

Named Mammoth, this new 8mm tape drive features 40 GB* of capacity, a blazing transfer rate of six megabytes per second* and an MTBF of 200,000 hours. Pretty heady numbers. And proof that Exabyte's 8mm technology is better than ever. Our products span a wide range, from the $1,295-6700LT for smaller LANS, to our new generation of automated libraries. You'll also see Mammoth drives in products from leading OEMs.

So to all you adventurous types, sorry. Exabyte's new 8mm technology does push the limits of performance. But it's still the safest choice out there. For more on our 8mm tape products, or for a free Mammoth Facts Technical Paper, call 1-800-EXABYTE.

EXABYTE®

FORM FACTOR

5.25 standard half-high

5.25 non-standard full-high

AUTOMATED SOFTWARE MANAGEMENT

Seminar Schedule

Atlanta	November 7	Montreal	November 5
Baltimore	November 13	Nashville	October 29
Boston	October 29	New York	October 31
Calgary	November 12	Orange County, CA	October 16
Charlotte	November 5	Orlando	October 30
Chicago	October 22	Philadelphia	November 12
Cleveland	November 6	Phoenix	November 19
Columbus	November 7	Portland	October 16
Dallas	October 24	Salt Lake City	November 13
Denver	November 14	San Diego	October 15
Detroit	October 24	San Francisco	October 17
Houston	October 23	Schaumburg, IL	November 8
Kansas City, MO	November 20	Seattle	October 17
Los Angeles	October 15	Stamford	October 22
Miami	November 6	Toronto	October 30
Minneapolis	October 23	Washington, D.C.	November 14

SEE A DEMONSTRATION OF EDM'S WINDOWS NT VERSION.

NOVADIGM

Attend the Only Seminar Focused Exclusively on Distributed Software Management

If your organization is deploying new client/server or Internet software, this is one seminar you can't afford to miss. And it's free.

Plan to attend a half-day presentation from the industry leader in software management, Novadigm, and learn how you can eliminate the most time-consuming, error-prone, and costly task in your IT management environment—managing distributed software.

At this seminar, you'll see first hand how Novadigm's new patented 'desired-state' software management technologies enable organizations just like yours to control distributed software's 'millions of moving parts,' automatically:

- Configuring rapidly changing client/server applications across thousands of desktops and servers—without manual intervention.
- Securing and enabling new intranet and Internet services for distributed employees, partners, and customers—reliably.
- Distributing shrink-wrap, operating system, and browser upgrades—'on-demand.'
- Integrating software management and network/systems management infrastructures—seamlessly.

This special invitation from Novadigm includes a sneak preview of a new release of its industry-standard EDM™ environment. It's a breakthrough that any IT professional would want to see ... and a must-attend event.

Register NOW. Call toll free 888.668.NOVA (6682) or visit www.novadigm.com.

CIOs in U.K. see outsourcing as a must

By Ron Condon
LONDON

Most aspects of information systems could be outsourced, so an IS department's survival may depend on its ability to work with the rest of the company — matching the technology to general business ends, according to a poll of the U.K.'s top IS directors.

Outsourcing

The results published in a new report from research company Ovum Ltd., based here, come from a focus-group discussion with 100 of the U.K.'s top IS directors and a survey of another 350.

The research aimed to see how information technology managers or chief information officers viewed their futures as organizations try to forge relationships with customers and suppliers.

The most likely areas of activity to be outsourced, according to the research, are application development and maintenance, network operation, data center operation and technical support.

At the other end of the scale, most IS directors said they would always preserve business analysis and systems strategy as in-house activities. The dwindling role of the CIO, according to the report, concerned many of those surveyed because they feared they would lose their jobs before they had enough money to retire. Their only future lies in becoming independent consultants, those executives said.

Where CIOs remain in their organization, they see the need to form alliances with managers in other departments.

One CIO said he thought human resources, marketing and IS directors could form a powerful triumvirate and share skills.

Rene Carayol, IS director of IPC Magazines Ltd., part of the publishing group Reed Elsevier, which has U.S.-based subsidiaries, has already started molding an IS department that is centered less around technical expertise and more around general business skills.

"Outsourcing should be one of the biggest opportunities for any IT director today," said Carayol, who aims to halve his department and staff it with people who can act as account managers. They can then look for business within the organization rather than act as technicians.

"The trick is to come up with the ideas first," he said, "There are no business opportunities that are not IT-driven these days. Therefore there are no IT projects, just business projects."

Seeking own jobs

IS departments have traditionally waited to be commissioned to do jobs, but now they have to go out and propose new projects, Carayol said.

"The days when IT could earn its keep by automating existing processes are over," he said.

He has already recruited a marketing manager for his IS department and has radical views about the kind of staff he needs. "I am not interested in technical skills. It is easy to train people in technical skills if we need to," he said. This means his new wave of staff includes people with business degrees, former actors and a former manager from McDonalds Corp. who now runs the help desk.

"I outsource the low-value-added stuff," he said. Instead, he is focusing on developing an Internet business for the 60 consumer magazines that Reed produces. "I don't build software, I build weapons, which will help me make money from the Internet. We are trying to exploit all our digital material."

Carayol said he sees himself as one of the most influential people in the organization besides the chief executive and said that an IS director has to be on the board of the company to have any real effect. "If you're not on the board, you're on the plantation," he said.

Condon writes for the IDG News Service's London bureau.

Ford project to cut prototype costs

CONTINUED FROM PAGE 65

Because the Big Three automakers are under pressure to make cars lighter and more durable, yet safer, "the ability to get them to market faster has become even tougher," said Michael Seely, president of CIMWorld, an online computer-integrated manufacturing publication based in Los Gatos, Calif. (www.cimworld.com).

About 1,000 engineers have been taught to use the Structural Dynamics software since January, leaving 7,000 engineers to be trained through 1999, Riff said. The custom training programs, developed separately for each of Ford's sheet metal, engine and other design groups, have been loaded onto the company's intranet to train the automaker's field staff.

Riff wouldn't say how much Ford paid for the Structural Dynamics software and training. Industry analysts said testing and prototyping is a fraction of Ford's $10 billion annual capital expenditures and $2 billion estimated information systems budget.

Ford doesn't "disclose a lot of that stuff. [The C3P investment] is a small number in the whole scheme of things," Ward said.

Project plans

The project is being used to launch two cars and a sport utility vehicle that Ford will introduce between 2000 and 2001. For competitive reasons, Riff and other Ford executives wouldn't specify which would be the first vehicle to be launched through C3P.

The Structural Dynamics package is also a quantum leap ahead of the automaker's homegrown, Unix-based CAD/CAM/CAE software it is replacing. For example, the software lets engineers look at "solid" models of components vs. the three-dimensional wire-frame models they used to struggle with, said John Anderson, a product engineering designer at Ford's Chassis division. "It's a huge step in graphic representation," Anderson said. With the 3-D wire-frame models, "it was tough to tell what you were looking at," said Anderson, who runs the Structural Dynamics software on a Silicon Graphics, Inc. Indigo II workstation.

Zoo Internet expansion on tap

CONTINUED FROM PAGE 65

ning the animal management system upgrade, wants the zoo to buy handheld computers that zookeepers could use to enter daily reports directly into the system. Now, zookeepers write these reports and enter them into the system manually.

Interactive site

The zoo has its own World Wide Web page, but Erb would like to take control of it internally, rather than use a local service provider and make the site interactive.

New members could sign up online or allow Web surfers to buy zoo gift items with the click of a button. An interactive site also will make conservation efforts easier; the zoo could highlight the survival plight of a particular monkey or elephant species, Erb said.

To find information for breeding and loan purposes, zoo officials share information with about 350 other zoos via the International Species Information System, a Minnesota-based data bank.

Thompson also communicates via electronic mail with members of a national Tree Kangaroo group that helps members find mates or temporary placements for their kangaroos.

Erb said zoo bandwidth will need to be expanded to accommodate images, X-rays and lab reports that pertain to the animals. But for now, Erb said T1 lines provide the necessary capacity for what the zoo can afford.

'net recruiting service pairs up

CONTINUED FROM PAGE 65

reduce hiring times and costs, according to Alok Singhania, vice president of marketing at IntelliMatch.

"I had an offer within a week," said Klein, who is now director of marketing communications at I-Planet.

"I didn't have to go through six rounds of interviews over the course of a month and a half, which is hard when you're already working full-time," she said.

Job postings grow

On any given day, there were a total of about 30,000 positions in the Top 25 online job banks, up from just 15,000 postings two years ago, according to a recent report by The Wall Street Journal.

But recruiters caution that online headhunting still isn't perfect.

For one thing, not all job seekers know precisely how to list their skills for scanning by electronic matching technology. As a result, some of the best candidates may get passed over, said Frank Poirier, a partner at Juntunen, Combs & Poirier, a technology recruitment firm in San Francisco.

And once a likely candidate is located, "there's still the same old-fashioned interchange to decide if this person is for us," said Cheri Comstock, a principal at The Focus Group, a recruitment firm in Chapel Hill, N.C.

"Just having a name is 20% of the work. It's still picking up the telephone after you see the resume," Comstock said. "At this point, the Internet just lets people know of each other, which is still valuable because it saves time."

Briefs

Coalition formed

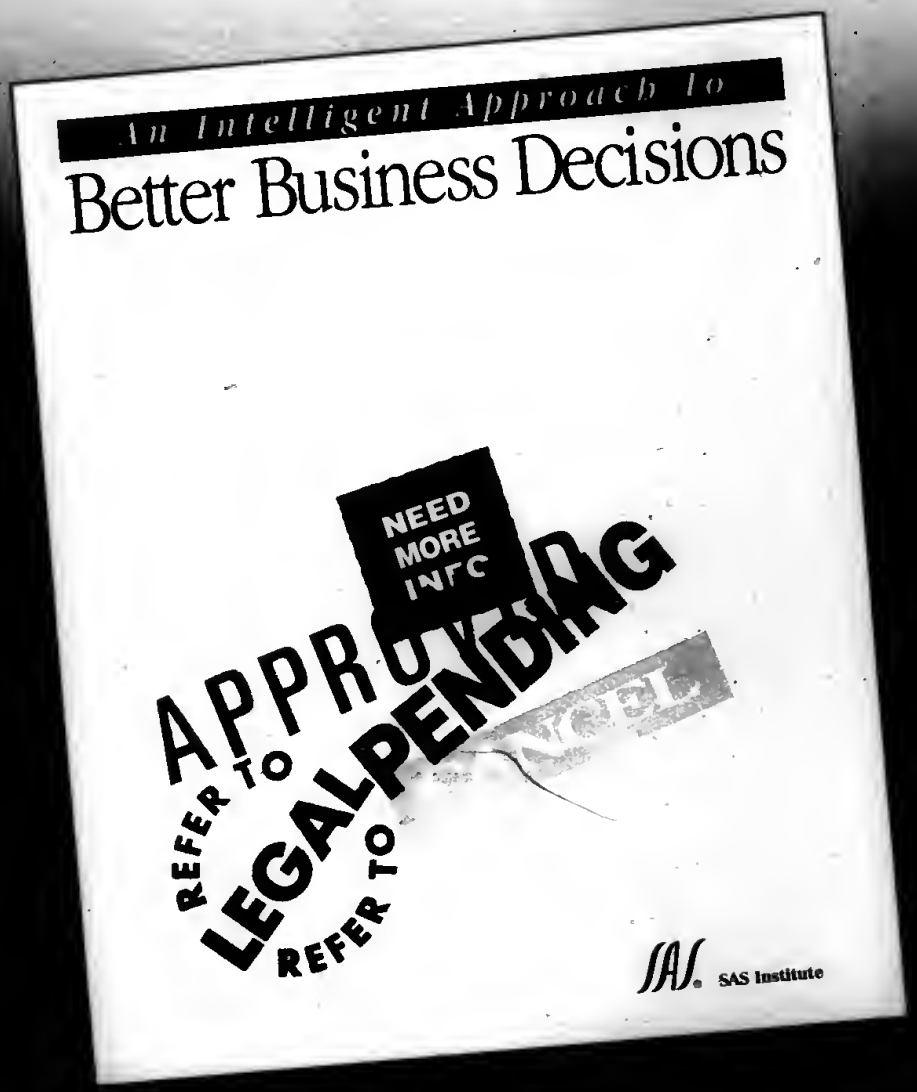
IBM, the United Nations and several other global organizations have formed The Coalition for Global Business Protection, a public/private effort to address disaster preparedness issues and to support improved corporate asset management practices worldwide. The group is being spearheaded by IBM's Business Recovery Services unit in Sterling Forest, N.Y. The service provides AS/400 customers with continuous recovery services across 50 countries.

Firm wins contract

Prudential Insurance Co. of America in Newark, N.J., has awarded a multiyear contract to Mountain Lakes, N.J.-based Computer Horizons Corp. to assist the insurer with its companywide year 2000 reprogramming effort. The contract is a continuation of Computer Horizons' previous year 2000 companywide assessment for Prudential. Terms of the agreement weren't disclosed.

Yours Free for a Limited Time

An Intelligent Approach to



Find Out How SAS Institute Makes It Easier Than Ever to Reach the Right Decisions...for Your Business and Your Budget.

Better Business Decisions

Making the right decisions is your business. Making them easier is ours. We're SAS Institute, the recognized leader in decision support solutions.

From providing immediate access to more than 50 databases and file formats, to turning raw data into real information using a full spectrum of applications, you'll find SAS software is your complete Business Intelligence solution.

- *On-Line Analytical Processing (OLAP)*
- *Enterprise Information Systems (EIS)*
- *Decision Support Systems*

SAS Institute puts it all together in one package, complete with menu-driven interfaces to make it all quick and easy.

And, since our software works the same across all your hardware, you won't have to purchase and support single-shot software packages that weren't designed to work together in the first place.

For Your Free Guide, Just Give Us a Call.

We believe every Business Intelligence solution should provide applications breadth and depth...a consistent interface to all your business data...client/server capabilities... and portability across all your hardware.

You'll find all that and more in software from SAS Institute. But first, we invite you to find out the facts for yourself in our free introductory guide...containing practical advice for exploiting the full potential of your business data, as well as insights from our software users and leading publications.

Simply call our world headquarters now at 919.677.8200, or send us E-mail at cw@sas.sas.com

SAS®

SAS Institute

The Business of Better Decision Making

Phone 919.677.8200 Fax 919.677.4444
In Canada 1.800.363.8397
E-mail: cw@sas.sas.com

You can also request your free guide, and learn more about SAS seminars in your area, by visiting us on the World Wide Web at http://www.sas.com/

SAS is a registered trademark of SAS Institute
Copyright © 1996 by SAS Institute

Managing

Still Going!

Frank Erbick. Jim Sutter. James Marston. They're some of the CIOs who've beaten the odds and kept their jobs for seven years or more. Here's how these survivors stay on top.

By Rosemary Cafasso

Frank Erbrick, chief information officer at United Parcel Service of America, Inc. in Atlanta, remembers an effort to build a system that would help manage the company's long-haul vehicles.

But the project turned into s boondoggle that cost the company several million dollars.

Smaller disasters have put other CIOs on the street. Yet Erbrick, also s senior vice president, carried on and is now in his 11th year as information systems chief at the package-shipping company.

In today's world, where IS executives seem to he replaced more frequently than the magazine selection in the corporate lobby, Erbrick can't offer s special formula to explain his longevity. He attributes it to s very basic premise: On balance, he has produced far more than he has lost for UPS.

His numerous successes — including an automated package-tracking system, s new financial system, a worldwide cellular network for transmitting packaging data and a system to manage the company's air delivery — outweigh the multimillion-dollar disaster.

"I had some big losers, believe me," Erbrick says. "But I had more big winners."

Erbrick is part of s group of CIOs that contradicts the long-held industry helief that the top IS job is s lose/lose proposition. True enough, many a CIO has been handed walking papers; a recent Deloitte & Touche industry survey cited an annual CIO turnover rate of 17%.

But another group of CIOs has stuck it out and achieved success at their companies.

A recent *Computerworld* survey of 100 firms shows that the typical CIO holds his or her job for 6.6 years [CW, Sept. 16]. That's ahead of the sverage tenures of vice presidents of sales, marketing, human resources and finance, the findings revealed. The only executive post with a longer average tenure is the CEO, at 8.2 years.

Computerworld recently tracked down 10 CIOs with tenures ranging from seven to 13 years. They attribute their longevity to years of experience that have included many painful lessons.

Defining success

They also point to their own persoual definitions of success.

Some CIOs focus on the next big job offer. Then there are others, such ss Erbrick, who measure their worth with a different yardstick.

"People have to have a sense of wanting to leave a legacy," he says. "You want to he remembered for a contribution, not living out the terms of your contract."

There is also an element beyond a CIO's control. In some cases, a CIO lands at s company that goes through a shake-up or merger and finds he doesn't fit in. But the biggest contributor to s CIO's longevity is very mucb in his own hands. These executives say it comes down to s basic hard-work ethic.

These CIOs say they haven't been fired because they produce. Most notably, they have cast aside some of the more frendy management notions that suggest they should spend more time schmoozing with the top brass and aggressively promoting their organizations, projects and themselves.

"I don't think self-promotion will make change occur," says Jim Sutter, CIO at Rockwell International Corp. in Seal Beach, Calif. Quiet — and serious — conferring with the CEO, not "a bombardment of promotions," will help position IS, he says.

These executives say the strategy of selling IS is more trouble than it's worth. They have learned that management isn't interested in hearing about IS' virtues. They want to see results. Furthermore, "selling" IS can put such s glaring spotlight on the organization that any small snag in s project will draw undue negative attention.

Silent partner

"Technology needs to be s silent partner instead of making a big splash," says James Marston, who for eight years has held the top IS slot at American Presidents Co. in Oakland, Calif. "If you want to live by publicity, then you will die by it if the project blows up."

The CIOs say the most significant recent change that has worked in their favor is a turnaround in management's thinking. Over time, more CEOs have come to better understand the difficulties inherent in technology-based projects, the CIOs say.

Tim Rhein, CEO of American Presidents, heaps high praise on Marston but also points out that it's been impossible for Marston to always deliver on time and on budget. Rhein says that is a fallout from the computer industry itself, where vendors make promises and technologies aren't always delivered.

"It's s charlatan industry, and it's really s shame," Rhein says. "Nothing we've ever done in IS has come in exactly on time or exactly on budget or has done exactly what we said it would do. Jim has been bitten by

DEFUSING USERS
HOW YOU CAN DEFLECT USERS' SLINGS AND ARROWS AT A GRIPE SESSION. PAGE 81.

that bug, despite his caution. It is just endemic to this industry. I have every confidence that Jim is as good as you get."

Even with supportive management, these CIOs say their positions demand the ability to juggle and finesse problems daily. Here are some of their suggestions for tackling the thornier issues.

Building credibility

The goal is to develop trust so management and users will believe a CIO when he says he'll do something. The only way to create trust is to deliver on projects. The sure way to lose it is to lie.

Thomas Loane, CIO for 13 years at Alamo Rent A Car, Inc. in Fort Lauderdale, Fla., says he lives by what he calls the "six-by-six rule" to build credibility. In other words, Loane will not allow any IS project to run more than six months and be staffed by more than six people. With each project small and tightly focused, it's impossible to end up with a big-money failure. By keeping it simple, IS regularly produces results.

Corporate politics

Another gotcha for a CIO can be corporate politics. Overall, the 10 CIOs say they avoid playing hardball politics at all costs and wouldn't get involved in turf wars and serious management battles. But they also say it's essential to pay attention to subtle changes in a corporate environment and adjust their plans accordingly.

Sutter recalls the dawn of client/server technology with a twinge. "It was a difficult time for all CIOs," he says. While there were many unknowns with the technology, the business side nonetheless heavily backed client/server. Sutter was smart enough to see that the technology would have a huge impact; to resist it would have damaged him and his organization. "We actually did have to try some things that we did not have a lot of confidence in. But to just say 'no' would not have been constructive, either," Sutter says.

In the end, Sutter's willingness to keep an open mind was the right choice because it furthered the good relations between business and IS.

The added bonus? "Not all of client/server turned out to be a mistake," he concludes. ■

Cafasso is *Computerworld*'s senior editor, Finance & Investing.

Steve Pollard

YEAR 2000 SCOREBOARD

THIS IS THE FIRST IN AN OCCASIONAL SERIES ON YEAR 2000 TRENDS, ISSUES AND STATISTICS

Demonic digits

Just how bad is the year 2000 problem? Jim Woodward, senior vice president at Cap Gemini America, a consultancy in New York, studied systems at three companies, looking for dates in their codes. He found the following nasty numbers:

Tick, tick, tick . . .

Are you behind on your year 2000 conversion? Here's an estimate from William Ulrich, a consultant at Tactical Strategy Group in Soquel, Calif., on what percentage of your code you will be able to make year 2000-compliant, based on when you started (or will start) working on it.

This time line assumes a company has 100 million lines of code to update and can devote (or outsource) 792 person-years to the job within three years. It assumes an aggressive, but realistic, work schedule.

Calling on Clinton

As if running for reelection weren't enough pressure, President Clinton is being asked to ensure the federal government's computer systems are year 2000-compliant by Jan. 1, 1999.

Sen. Daniel P. Moynihan (D-N.Y.), in a Sept. 5 letter, warned the president of "extreme negative economic consequences" that the year 2000 issue poses. Moynihan wants Clinton to name an aide who would assure that all federal agencies and commercial and industrial firms that do business with the government are compliant by Jan. 1, 1999.

Peter De Jager, a Toronto-based year 2000 consultant, says the British government is ahead of its former colonies. London recently set aside more than $250,000 to alert businesses to the year 2000 threat. "The best thing government can do for this problem" is to provide a tax break for year 2000 work, he says.

Year 2000 Scoreboard, page 76

They're every reason you bought a mainframe.

INTRODUCING SUN'S NO-COMPROMISE ENTERPRISE SERVERS. THE FIRST IN HISTORY TO GIVE YOU MAINFRAME CALIBER COMPUTING WITH THE BENEFITS OF OPEN SYSTEMS.

You bought a mainframe because of the reliability, capacity, throughput and control. But they lacked the flexibility, information-access and applications of client/server computing. Now, you can have the best of both worlds—the Sun™ Ultra™ Enterprise™ Servers combine the benefits of network computing with the capacity, reliability and control of a mainframe to give you an entirely new level of computing. Whether you need immense data warehouses or the ability to support thousands

And every reason you didn't.

of users, Sun delivers. Up to 30 processors, 30 gigabytes of memory, mainframe-class I/O, and 10 terabytes of storage. And with Solaris™ operating environment you get the ability to expand in all directions so you can have capacity on demand. Plus, you'll have the confidence of a system engineered with the industry's best reliability features, every major system component is redundant and hot-pluggable. Naturally, these systems are backed by world-class service, and round-the-clock mission-critical support. Factor in Solstice™ software, a comprehensive suite of tools and services, and you've got centralized control of your entire network. Thanks to our premier software partnerships, these servers are the ideal platforms on which to run all the leading business applications. Sun Ultra Enterprise Servers. The era of enterprise network computing is here. To learn more, contact http://www.sun.com or give us a call at 1-800-786-0785, Ext. 410.

Sun
THE NETWORK IS THE COMPUTER™

YEAR 2000 SCOREBOARD

1188

THIS IS THE FIRST IN AN OCCASIONAL SERIES ON YEAR 2000 TRENDS, ISSUES AND STATISTICS

CONTINUED FROM PAGE 73

Cobol rides again

After years of derision and retraining to master more modern languages, Cobol programmers are in demand. Not for new projects, but to find and fix limited date fields in old code so programs won't choke during the millennial turnover. One Cobol-literate programmer said he refuses to sign any contract longer than three months because salaries keep rising so fast.

But the demand is nothing compared with what it could be in the next six months to a year, according to Bruce Hall, a research director at Gartner Group, Inc. Most organizations, he says, are still in the high-level validation stage of the year 2000 problem and will need Cobol programmers for more detailed analysis down the road.

Legal advice (and it's free)

Is your company gearing up to head off doomsday? William A. Tanenbaum, a partner at the New York law firm Rogers & Wells, has some tips for making sure your software is equipped for the new millennium:

- If your software isn't year 2000-compliant, but the vendor promises it will be at a certain date, any agreement should include language that specifies how and when the program will handle years in the new century. Also, Tanenbaum says, you should insist on an objective test of the software after it's changed.
- Software agreements should guarantee that any modifications that make a program year 2000-compliant won't corrupt any data or introduce any viruses into the company's network.
- If you hire a millennium conversion company, it should secure from the vendor of the original software a right to obtain, and have the conversion company modify, the source code for that software.
- A company's board of directors, as stewards of the firm's assets, needs to be aware of and involved in the software compliance program. Although the general rule is that directors can't be held liable for matters beyond their knowledge or control, they may not be able to rely on that defense if they are sued over a year 2000-compliance issue.

Backtracking

There are 1,188 days to Jan. 1, 2000. To demonstrate how close (or far away) that date is, here's a snapshot of the world 1,188 days ago — July 1, 1993:

- *Jurassic Park* was No. 1 at the box office.
- Major League Baseball was playing its final season with its 28 teams split into only four divisions.
- Spanky McFarland of *Little Rascals* fame died.
- Newt Gingrich was leader of the Republican minority in the U.S. House.
- Diana, Princess of Wales, celebrated her 32nd birthday. She and Prince Charles separated the year before.

November workshops

A listing of workshops for IS managers. Some are offered in later months in other cities. To find the time and location most convenient for you, contact the sponsor.

Effective Skills for Technical Managers. Los Angeles, **Nov. 5-8** — Fee: $1,595 to $1,995. Contact: Learning Tree International, Inc., Reston, Va. (800) 843-8733. Fax: (800) 709-6405. E-mail: uscourses@learningtree.com. World Wide Web address: www.learningtree.com.

Software Project Planning and Management. Washington, **Nov. 5-8** — Fee: $1,595 to $1,995. Contact: Learning Tree International, Reston, Va. (800) 843-8733. Fax: (800) 709-6405. E-mail: uscourses@learningtree.com. Web address: www.learningtree.com.

Software Quality Assurance. Ottawa, **Nov. 5-8**; Washington, **Nov. 12-15**; Toronto, **Nov. 19-22** — Fee: $1,595 to $1,995. Contact: Learning Tree International, Reston, Va. (800) 843-8733. Fax: (800) 709-6405. E-mail: uscourses@learningtree.com. Web address: www.learningtree.com.

Identifying and Confirming User Requirements. Washington, **Nov. 5-8**; Ottawa, **Nov. 12-15**; Los Angeles, **Nov. 19-22** — Fee: $1,595 to $1,995. Contact: Learning Tree International, Reston, Va. (800) 843-8733. Fax: (800) 709-6405. E-mail: uscourses@learningtree.com. Web address: www.learningtree.com.

Developing Executive Leadership. San Francisco, **Nov. 6-8**; Atlanta, **Nov. 13-15**; Scottsdale, Ariz., **Nov. 18-20** — Fee: $1,350 to $1,550. Contact: American Management Association, Saranac Lake, N.Y. (800) 262-9699. Fax: (518) 891-0368. E-mail: cust_serv@amanet.org.

Strategic Information Systems Planning. Chicago, **Nov. 6-8**; Hilton Head Island, S.C., **Nov. 20-22** — Fee: $1,450 to $1,650. Contact: American Management Association, Saranac Lake, N.Y. (800) 262-9699. Fax: (518) 891-0368. E-mail: cust_serv@amanet.org.

Software Licensing Agreements. Denver, **Nov. 7**; Scottsdale, Ariz., **Nov. 8**; Orlando, Fla., **Nov. 14**; Fort Lauderdale, Fla., **Nov. 15** — Fee: $495. Contact: Professional Learning Center, Irvine, Calif. (714) 725-0758.

Disaster Recovery Planning. New York, **Nov. 7-8**; Fee: $1,295 to $1,475 — Contact: American Management Association, Saranac Lake, N.Y. (800) 262-9699. Fax: (518) 891-0368. E-mail: cust_serv@amanet.org.

Intranets: Building and Supporting an Internal Web. Boston, **Nov. 7-8**; Washington, **Nov. 25-26** — Fee: $895. Contact: Data-Tech Institute, Clifton, N.J. (201) 478-5400. Fax: (201) 478-4418. Web address:www.datatech.com.

Managing Technical Professionals. San Francisco, **Nov. 13-15** — Fee: $1,245 to $1,430. Contact: American Management Association, Saranac Lake, N.Y. (800) 262-9699. Fax: (518) 891-0368. E-mail: cust_serv@amanet.org.

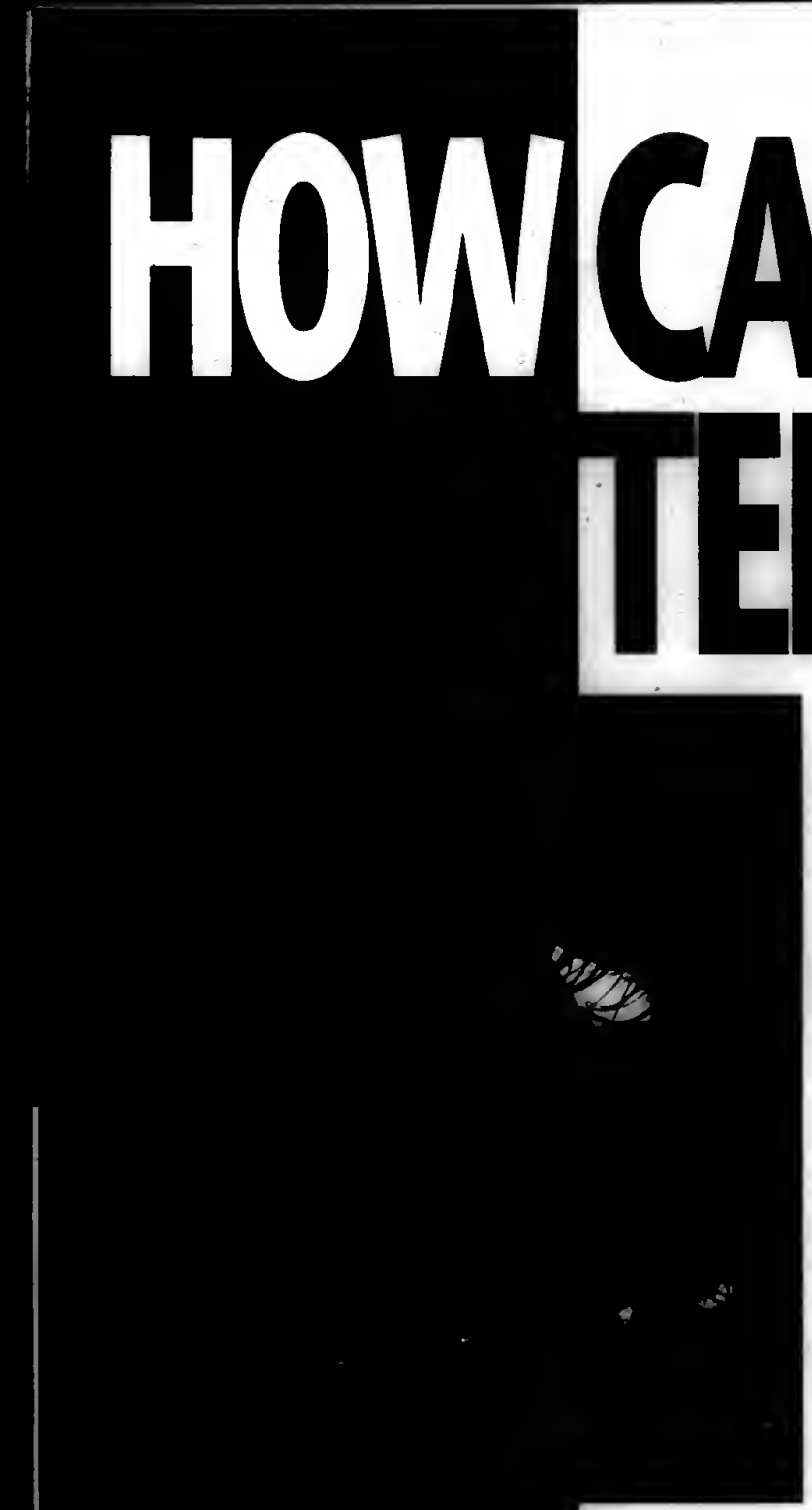
Communication and Interpersonal Skills: A Seminar for Technical Professionals. New York, **Nov. 13-15** — Fee: $1,195 to $1,375. Contact: American Management Association, Saranac Lake, N.Y. (800) 262-9699. Fax: (518) 891-0368. E-mail: cust_serv@amanet.org.

Online this week

COMPUTERWORLD

Check our Web site at www.computerworld.com for information on upcoming workshops and conferences.

HOW CAN TELL



SEEING IS BELIEVING.

Amdahl is now delivering the first complete Windows NT solutions for the enterprise — our EnVista family of enterprise servers, storage systems, software and high-speed connectivity solutions.

Based on Intel Pentium Pro processors, EnVista Frontline Servers and clustered Central Servers support mission-critical applications with unsurpassed data access from the datacenter to the desktop.

Our EnVista storage solutions offer continuous data availability, scalable performance and capacity to meet your most demanding Windows NT application needs. And, our services experts are ready to help you with deployment and ongoing support.

See real enterprise NT solutions for yourself. Today. Only at Amdahl: (800) 223-2215 or www.amdahl.com

FOR INFORMATION ON OUR "MASTERING YOUR NT TRANSITION" SEMINARS, SEE WWW.AMDAHL.COM

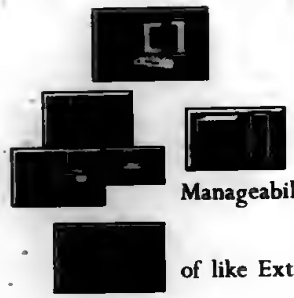
intel inside
PENTIUM PRO PROCESSOR

amdahl
BRING US YOUR HARD PROBLEMS.™

IT'S ONLY LOGICAL THAT INTELLIGENT MANAGEAB

(NOW, WHAT THE HECK IS IN

I'm burnt.
I need a vacation.



Intelligent Manageability is kind of like Extra Sensory Perception for a computer and every new Compaq Deskpro has it. It lets you know if something's going to happen before it actually does. This way you can manage all of the desktops on your network from one location.

Taking inventory, for instance, of all hardware and software is done simply and efficiently from one Deskpro. Or if a hard drive's about to fail anywhere, you'll know ahead of time. As before, Intelligent Manageability backs up your data on the network in case of failure; but now, thanks to our new PD-CD drive backup, it also preserves your data locally.

Okay, so our newest version of Intelligent Manageability is smart. But affordable? Considering that the Deskpro line from Compaq starts at around $1,100,* we think so.

Equally impressive are the high-performance features. Up to Pentium® Pro 200 processors. Choice of PCI graphics. Plus a choice of EIDE and Ultra SCSI hard drives.**

And maintenance? That's easy because we deliver continually updated support software via our Web site and CDs. And so is upgrading and servicing, thanks to a quick-release CPU hood and accessible components.**

In the end, Intelligent Manageability gives you a lowered cost of

©1996 Compaq Computer Corporation. All rights reserved. Compaq and Deskpro registered U.S. Patent and Trademark Office. Deskpro is covered by our 3-year limited warranty. *Price mentioned is estimated street price. Dealer prices may vary. are registered trademarks and the Pentium Processor Logo and the Pentium Pro Processor Logo are trademarks of Intel Corporation. Other products mentioned may be trademarks or registered trademarks of their respective companies.

ILITY ALSO COMES WITH AN INTELLIGENT PRICE.

TELLIGENT MANAGEABILITY?)

Call MIS.

ownership, a three-year warranty and dedicated toll-free technical support that's open for business seven days a week, 24 hours a day. And what could possibly be more logical than that? For more, visit us at www.compaq.com or call 1-800-392-8883.

*The Deskpro line starts at around $1,100.**

COMPAQ

Has It Changed Your Life Yet?

*Features vary by model. Monitor not included. Thermal sensor available only on Deskpro 4000 and 6000. Some features available with Compaq Deskpro and independent software applications. Other features only available with Windows 95. The Intel Inside Logo and Pentium

Pure and Atria have merged

No, tha world hasn't changad.

Parking tickats haven't disappeerad.

Airline food hasn't baen improved.

Tha opposita sax isn't any aesier to understand.

But tha combinetion of our software diagnostic products,

softwara devalopmant enterprise producta,

and application testing products

has created an Automated Software Quelity soiution

that will halp your team work together more effectivaly.

Which maans you'll be abla to build bettar softwara.

We've merged.

On second thought, maybe the world has changed just a little.

PURE ATRIA

THE FOUNDATION FOR BETTER SOFTWARE

To find oat more, visit oar web site - www.peraatria.com

© Pure Atria Corp. Our products include Purify, Quantify, PureCoverage, ClearCase, CiserCase MultiSite, ClearGuide, PureDDTS, PureTestExpert and PurePerformix.
We can also be reached by calling (800) 353-7873.

from 'GRIPE-IN' to 'Love-In'

*Afraid of your next meeting with users? Here's how some IS managers turn hostility to constructive energy/*By Kathleen Melymuka

Eileen Strider took the dynamite out of a potentially explosive meeting with users.

"I knew they were unhappy. That's why they were inviting me."

But this was an invitation Eileen Strider couldn't refuse.

It was a command performance at the national sales meeting to "discuss" Unicover, a cantankerous policy system that is more than 20 years old. Unicover was the bane of the field sales force at Universal Underwriters Group in Overland Park, Kan. It was also Strider's baby. As vice president of information systems, she was the one on the firing line. Her challenge: Defuse the situation.

For her presentation, Strider asked one of the general managers to come up and play the role of Unicover as she presented a "This Is Your Life"-type description of the evolution of the system.

She gave the general manager five Monopoly houses, which symbolized the five regional offices Unicover served at its birth in 1971. She also gave him a thick manual to symbolize each insurance product the system maintained.

As the narrative progressed and new offices and products were added, she piled on more houses and manuals.

Around the time "Unicover" was serving 28 offices and balancing a tower of manuals, he started to "break down" and needed fixes. "I stuck neon Post-its all over him," Strider says. "He moved, and the manuals all fell, but I told him, 'The system has to work all the time!'"

When the company added a new business unit that specialized in auto-repair work, Strider called a second manager forward, hung jumper cables around his neck, handcuffed him to the first manager and explained that the two would now have to operate in tandem. When the data center moved to Chicago, the handcuffed pair had to duck-walk across the room, never dropping the manuals, houses, Post-its or cables.

Finally, Strider called a bunch of senior officers to the front. "I gave them each a card with the name of a major change we'd recently been asked to make to the system. I said, 'Your job is to do everything you can to get your change in first.'" The presentation ended with the officers climbing all over the hapless "system," pushing each other out of the way and even stuffing bribe money in the "system's" pockets.

Strider's presentation defused the situation and left her would-be critics helpless with laughter. "It was a lot of fun, but I think it conveyed a message," she says. "They hadn't understood the complexity of what we were dealing with. They said, 'Gosh, we had no idea!'"

Sooner or later, most IS managers face a hostile audience of users for a gripe session, but survivors and experts say there are ways to channel that hostility constructively.

Strike first

IS managers agree the best defense is a good offense. "Do it with them before they do it to you," says Jeanne Simia, director of information services at the American Association of Retired Persons in Washington. "If they're calling you for a session, you're already in trouble."

Simia hasn't been the victim of a gripe session, because her management style heads them off.

When she felt trouble was brewing, Simia invited her customers to take part in a series of focus groups in which they evaluated systems, discussed problems and worked toward solutions. Asking users for advice disarmed them and resulted in more constructive criticism, she says. Now, she follows up with frequent, random spot checks of user satisfaction.

If it's too late to make the first move, let the users vent, and listen to them. Don't interrupt and don't disagree. "Let people exhaust their emotional energy," says Naomi Karten, a former IS manager who is now president of Karten Associates, a Randolph, Mass., consulting firm that specializes in customer service.

When a customer is finished, repeat what you heard so both of you are sure you understood. If complaints are valid, acknowledge them. "People expect that you'll deny and resist," Karten suggests. "Admitting disarms emotion."

If complaints are invalid, accept that you have to deal with reality as the user sees it. "It doesn't matter that you know the user doesn't know what he's talking about," says Madeline Weiss, president of Weiss Associates, Inc., a management and human relations consulting firm in Bethesda, Md. "The user is a customer, and if that's how the user feels, it doesn't matter what the reality is."

10 tips to tame the hostile hordes

- *Shut up and listen*
- *Don't be defensive*
- *Let them know you hear them*
- *Acknowledge legitimate complaints*
- *Accept that their perception is their reality*
- *Help them see YOUR reality*
- *Channel criticism constructively*
- *Don't respond on the spot*
- *Do something and tell them about it*
- *Use humor and imagination*
- *Do it with them before they do it to you*

While accepting users' reality, try to help them understand a little of your own, as Strider did. You can nudge users in the right direction when their comments show they don't get it, Simia says. "If somebody wants training on every software package, we say, 'In light of the 482,000 software packages and the fact that we have two professional trainers, how would you prioritize their activity?'"

Finally, as you prepare for a session, use your imagination. "Give them an experience that's visceral and get them involved in it," Strider says. "When you're the one sitting there with houses and Post-its trying to keep things together, you know what it feels like." ■

Melymuka is a freelance writer in Duxbury, Mass.

Online this week

COMPUTERWORLD

Ever been besieged by angry users? Share your experiences this week in an online discussion at our World Wide Web site (www.computerworld.com), facilitated by Naomi Karten.

Buyer's Guide

GRAPPLIN' with GROUPWARE?

Save yourself some time. Learn from those who've been there. Fortune 500 groupware users we surveyed share their progress and their pains. BY CATHLEEN A. GAGNE

"I think the Internet expos[ed] body to what groupware w[as] do. It's the best marketing [for] groupware in the world. The I[nternet] finally explained to people wh[at] sharing information was all about in a rich-text format."

Richard Truex,
Director of technology,
Pulitzer
Technologies,
Inc., St. Louis

[...] step at a time, and try not to [...]olution top down but let it be [...]e people who are going to be [...] and [...]ents."

[...] McCabe,
[...] president
Americ[...]anagement
[...]ystems, Inc.
R[...]d City, Calif.

"Users are getting increasingly more comfortable as well as creative with their groupware tools and consequently are becoming more productive."

Frank Grayeski
Vice president and CIO,
Interpublic Group
of Companies,
New York

PHOTOS CREDITS CLOCKWISE, RICHARD MORGENSTEIN, MICHAEL MELIA, ROGER RESNICK. PHOTO COLUMN: ERIC PARKER

USERS SPEAK OUT

UTTER THE WORD "GROUPWARE" to inexperienced users who may think of it as E-mail with an attitude and you'll probably hear some groans. But discuss it with managers at large organizations who've cultivated groupware to meet their needs, and you may hear thundering applause or even witness a gleeful rendition of the "Macarena."

The latter is the impression we got from the comments of 25 groupware users at Fortune 500 companies. Many of those information systems managers emphatically support their groupware strategies and have no interest in switching products at this stage, according to a telephone survey conducted for *Computerworld* by Market Data Group in Framingham, Mass. The products are meeting their organizations' business needs, and users are slowly gaining confidence with the concept of groupware.

Yet, there is a wild card in the deck — the Internet. The impact of the Internet on groupware has users abuzz with excitement — but wary. The Internet can affect groupware selection. Users want smooth connections to the Internet, and they expect their groupware solution to enable this.

It also is apparent that groupware is finally busting away from the E-mail-only mentality. But successful implementations won't happen overnight. The process takes patience and fine-tuning and has to allow for the impact of the 'net.

Computerworld cast the survey to solicit advice and to learn from users who've reached a point of comfort in the groupware process. Those users are pleased with their groupware strategies and want to share their trials and tribulations with you.

Gagne is *Computerworld*'s senior editor, Buyer's Guide.

INTERNET IMPACT

The Internet is infiltrating almost every segment of technology, and groupware is no exception. The most pervasive finding in our survey is that people are excited, worried, confused, rethinking their strategies and just plain curious about how the Internet is going to affect their groupware tool of choice.

"Here's where the confusion starts to come in," says Dave Juchniewicz, director of new technologies at American Standard Companies, Inc., and user of Microsoft Exchange. "All of a sudden, you have this groupware, which works well for the internal needs of the corporation, but the problem is that the external world may not have Exchange or Notes. Enter the Internet, which provides yet another way to get information out to the customers and to the consumers."

The Internet's impact is worth weighing as you consider groupware products. Comments below from our survey respondents uncover issues that may offer you insight and food for thought as you begin the buying or decision-making process.

HIGHLIGHTS

User concerns and questions

- The Internet creates security and bandwidth issues in groupware.
- The Internet validates and expands the viability of groupware.
- The Internet raises the bar of expectations. Outside parties expect all documentation to be available online.
- Internet gateway upgrades, Internet security and flexibility are becoming important issues.
- The Internet creates a need for an Internet content repository.
- Are the Internet and groupware duplicating each other?
- The Internet is helping drive down groupware licensing costs.
- Is the Internet going to displace Internal networks?

"It's very important to us that the technologies we're choosing can extend outside."

Tom Mischka, vice president of information technical customer services, Aid Association for Lutherans, Appleton, Wis.

"The Internet is going to allow groupware to do many more things than it's ever been able to do. The question then, is 'How valuable will Lotus Notes, GroupWise and Exchange still be when everybody has a browser?'"

Eric Goldreich, director of IS, Sheppard, Mullin, Richter & Hampton, Los Angeles

"We're integrating all our communications into the browser. We are playing with the idea that the browser is the desktop."

Dennis Lynch, team leader, U.S. Federal Trade Commission, Washington

INSIDE

APPLICATIONS

The groupware category, also known as collaborative software, is expanding, leaving some managers wondering just what it encompasses. However, it's clear that groupware's potential extends far beyond simple E-mail, scheduling and document management. Some users say they now use groupware for core business functions such as creating World Wide Web pages, electronic commerce and tracking customer requests. Even the lines between the terms groupware and browsers are becoming fuzzy. Check out how groupware is being applied, page 84.

WISH LIST

Although users say they're very satisfied with their product, they'd like to see improvements: They want their tools to be more compatible with the Internet; they want HyperText Markup Language and Java application functionality; they want voice mail to be integrated with groupware. Turn to page 84 to see more of the respondents' wishes and wants.

PEER POINTERS

The key slice of advice when entering the groupware process? Take it slowly. That means plan for it, offer loads of training and conduct pilots. For more tips on implementation, see page 86.

STRENGTHS & WEAKNESSES

This survey was open-ended in terms of products. We were more interested in how large organizations were applying groupware and in turn wanted to pass along their implementation advice to you. Surprisingly, all 25 respondents were either using Lotus Development Corp.'s Notes (16), Microsoft Corp.'s Exchange (2) or Novell, Inc.'s GroupWise (7). Users also cited strengths and weaknesses for their products, page 86.

QUICKPOLL

In a separate survey, we took one more look at groupware vs. the Internet. In that survey through Computerworld's home page, @Computerworld, it was clear that users feel groupware will evolve into a good front end for Intranets. A summary of that survey is on page 88.

CONTINUED FROM PAGE 83

APPLICATIONS

One thing is certain: Groupware has become a catchall term.

"The whole term of groupware is sort of vague," says Dennis Lynch, team leader at the Federal Trade Commission in Washington. He considers groupware to mean E-mail, scheduling, tasking, document managing, a central repository, the ability to have conferencing . . . well, that's a start. For most, groupware reaches far beyond E-mail and document management. The survey highlights and quotables give you an idea of just how far groupware is extending.

HIGHLIGHTS

Each manager interviewed uses groupware in several of the following ways:

- For remote access and functionality across dispersed locations
- For competitive monitoring
- For discussions and collaborative work within project teams
- To track correspondence by controlling the routing of documents
- To convert from a mainframe system to a client/server system
- To build a platform for electronic commerce
- To track hardware and software inventory
- To track customer service requests and purchase orders
- As a publishing platform
- To launch a Web site
- To monitor workflow

QUOTABLES

"Our general strategy is to provide worldwide capabilities for virtual team collaboration using a mix of product capabilities."

Roger Garlepy, principal IT associate, Air Products & Chemicals, Allentown, Pa.

"We thought the newsroom had a real potential area for collaborative software. We wanted to publish on the Internet. We wanted to have a single software application that everyone could use to communicate and share."

Richard Truex, director of technology, Pulitzer Technologies, St. Louis

WISH LIST

What do managers want to see in future groupware versions?

The majority of the survey respondents indicated that they're very happy with their groupware product. In fact most indicated that they have no interest in switching products at this stage.

However, when asked, most respondents were able to point out how their groupware solutions could improve. Vendors, are you paying attention?

HIGHLIGHTS

Here's a look at users' assorted wishes and wants – along with some reasons

- More bandwidth and security
- A case-based reasoning engine to distinguish patterns inside a database
- The ability to link to powerful databases such as Oracle or Sybase
- HTML and Java application capability
- More user-friendly development environment
- Easier remote access
- The ability to do incremental backups, in effect leveraging the replication capability
- Improved authoring and administration for HTML
- Voice-activated capabilities
- Graphical workflow capabilities
- Anytime, anywhere access to information, including E-mail, voice mail, fax and calendars

QUOTABLES

"We are always looking for better tools for maintaining the product, especially remotely. Our users always look for seamless integration with their other applications. The groupware vendor with the most openness will succeed."

Frank Grayeski, vice president and CIO, Interpublic Group, New York

"I would like to see a flexible, intuitive user interface with equal access to data no matter where it resides. From an administrative or management perspective, I would like to have the tools to deliver that efficiently, cost effectively and with

Richard Morgenstern

Within our groupwars solution, "there is a repository of information that represents our intellectual capital, which is used for discussions and collaborative work within project teams."

Janet McCabe, vice president, American Management Systems, Redwood City, Calif.

Our strategy includes E-mail, fax, knowledge sharing through discussion forums, scanning, document management, workflow and scheduling.

Dietta D. Slayton, business planner, The Sports Authority, Fort Lauderdale, Fla.

the ability to centrally monitor and manage it."

Larry Goering, project leader, Monsanto Co., Unified Communications, St. Louis

"I'm in the operations end of the business, and I need management facilities in groupware. I need statistics that constantly monitor my system. I need to know how many messages are being sent from place to place. I need to know the level of activity. This is the kind of information I need."

Dennis Lynch, team leader, Litigation and customer support center, Federal Trade Commission, Washington

PEER POINTERS

Start small, conduct pilots, spend sufficient time training users and don't underestimate administrative resource demands. These are among the tips most commonly offered by managers who have implemented groupware projects. "Take it one step at a time," cautions Janet McCabe, vice president at American Management Systems in Redwood City, Calif. "And over time, given proper management, it will come together and become a robust environment."

HIGHLIGHTS

Implementation do's [illegible] users who've been there

- [illegible] what you need [illegible] the products. Then look for the [illegible] solution.
- Check it out for yourself before you deploy it.
- Understand your corporate culture and your company's readiness to move into groupware deployment.
- Understand the impact the product will have on your network and your servers.
- Hit a support contract to give you all the support you need.
- Determine how mobile your users are.
- Be aware that you can't satisfy [illegible] users all the time.
- Avoid multiple groupware solutions. [illegible] one.
- Decide on a solution that will [illegible] your current and planned infrastructure.
- [illegible] detailed plans and [illegible] everything is thought-out before [illegible] is deployed.
- Partner with someone who has already deployed groupware and is using it successfully.

[redacted]

"Pick good applications where success is predicted, and offer incentives for use."

Joseph Jesson, senior systems consultant, IT architecture, Standards & Technology Evaluations, Amoco Co., Chicago

Control the development environment. "Users will want to do their own little piece of the operation without looking at the total process from cradle to grave, and that is when problems can come up."

Steve Smith, director of Information Resources Division, Farm Credit Administration, McLean, Va.

Provide very heavy training. "We piecemealed the training and ended up with a lot of one-on-one questions from our users."

Denni Interliggi, director of MIS, GenCorp, Inc., Fairlawn, Ohio

SEND AND RECEIVE MESSAGES.

THERE'S MAIL.

Novell.
Everything's Connected.

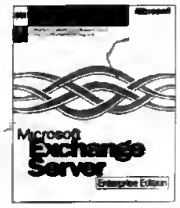
GroupWise

AND NOW THERE'S G MAIL.

SEND AND RECEIVE MESSAGES, FAXES, VOICE MAIL, PAGER MESSAGES, INTERNET, INTRANET, CALENDAR, REMOTE ACCESS, CONFERENCE CALLS, WORKFLOW MANAGEMENT, DOCUMENT MANAGEMENT AND UNIVERSAL MAILBOX.

STRENGTHS & WEAKNESSES

Although our survey wasn't intended to discuss specific products as much as implementation issues, we did ask for feedback on the products that surveyed participants use. Our random survey drew 16 users of Lotus Notes, seven users of Novell's GroupWise and two users of Microsoft's Exchange. Keep in mind that Exchange hasn't been around as long as the others.



Lotus' Notes

- Security drew the highest praise, particularly in how only authorized users can be given access to sensitive information in an environment used by the entire staff.

Other strengths cited by multiple users:

- The product's maturity and scalability.
- Replication. "Replication allows people to work as islands."
- Ease of application development.

- Users were the least happy with the product's management, administration and development. They complained that Notes requires specialized training and dedicated resources to address this.
- Notes is expensive.
- Its user interface isn't intuitive.
- It requires a fairly gutsy client.
- Navigating new databases isn't always obvious.

Novell's GroupWise

- A handful of users said GroupWise's ability to be cross-platform was most important to them.

Users also cited:

- Ease in using and learning.
- The ability to share documents.
- Richness of features such as calendaring, scheduling and remote access.
- Robustness of the system.

- Support seems to be a trouble spot for some GroupWise users. One felt as though Novell "fell off the earth" after the company sold off WordPerfect.
- A few of GroupWise's users cited strengths, including calendaring, scheduling and remote access, which were seen as weaknesses by other users.
- It's expensive.
- It takes time to install and upgrade.

Microsoft's Exchange

Keep in mind that only two people surveyed used Exchange, so the scope of opinions is limited and may not represent the user community. Here's what the two users liked:

- The electronic forms that are built through Wizards, which fire up Visual Basic and execute, build and compile all the code.
- Public folders, bulletin boards, group scheduling, discussion groups, task management, forms, document processing and workflow.

And here's what they didn't like about it:

- Poor password administration.
- Setting up the Internet connection.
- One of the users ran into a glitch when he learned the E-mail systems of three separate divisions wouldn't be compatible unless they were considered just one organization.

QuickPoll

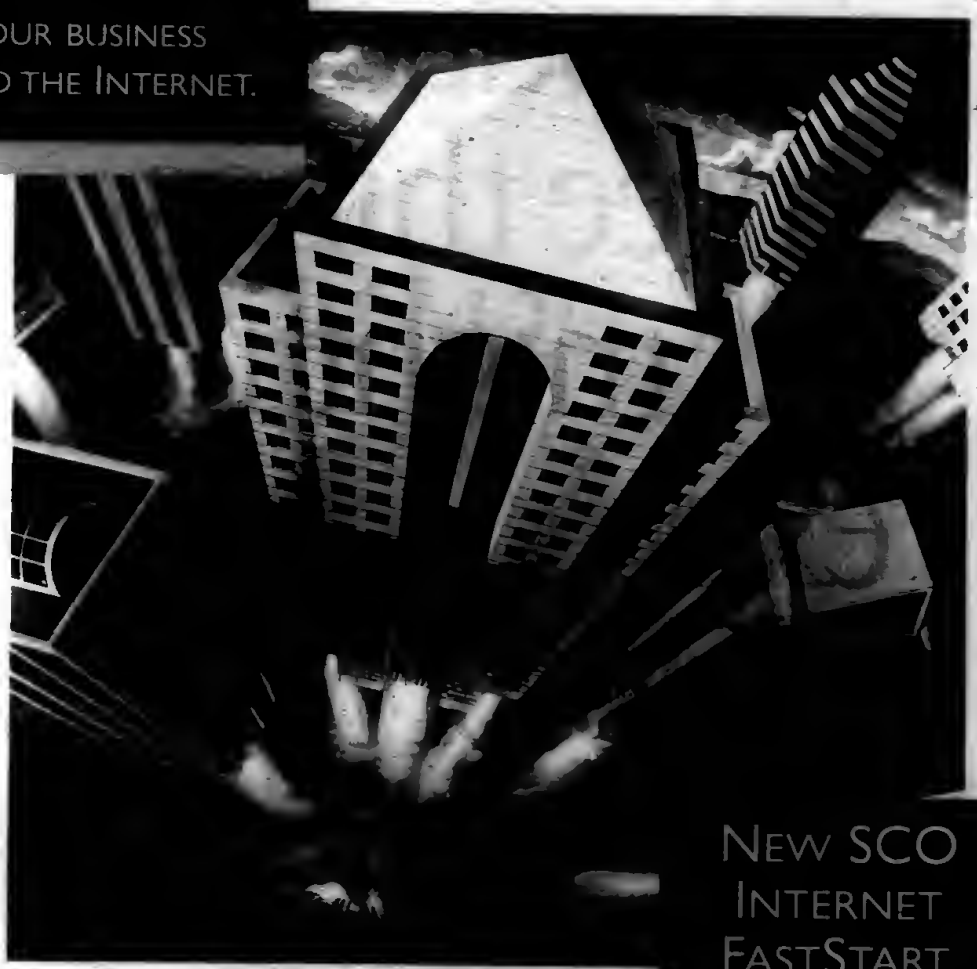
COMPUTERWORLD

Groupware, front and center

Plenty of people have plenty of questions about the interaction of groupware with the Internet and intranets. Yet one scenario may have support in the Internet user community — today's groupware packages could turn into interfaces for the World Wide Web.

Computerworld offered Web users the chance to ring in with their opinions about the future of groupware and intranets. Of 156 users who responded to a survey through the @Computerworld home page (www.computerworld.com), 73% said groupware will evolve into good front ends and organizers for Web-based applications. Although the poll results aren't scientific, they could provide insight into what IS managers are thinking, particularly if those managers are active Web users.

THE MOST AFFORDABLE WAY TO LAUNCH YOUR BUSINESS ONTO THE INTERNET.



NEW SCO INTERNET FASTSTART. $995.

THE WORLD'S MOST AFFORDABLE BUSINESS CRITICAL INTERNET SERVER.

Without SCO® Internet FastStart, deploying Internet access across your enterprise is extremely expensive. FastStart gives you the power and reliability of a UNIX® system at a very low cost. And because it can be deployed on inexpensive Intel® processor-based servers, your hardware costs are lower, too.

FastStart lets you access, publish and conduct business on the Internet. And to share internal information via Intranets. But it doesn't take a rocket scientist to install and maintain.

SCO Internet FastStart Includes:

- **SCO OpenServer™ Enterprise**
- **Netscape Communications Server™**
- **Netscape Navigator™ 2.0**
- **Multi-line PPP and Multi-homing support**
- **Graphic Installation and Configuration Tool**

Don't risk grounding your business with a more expensive, less reliable server solution. Call SCO today.

SCO

1-888-SCO-4YOU
code IFQ396

www.sco.com/ad/IFQ396

SCO, The Santa Cruz Operation, the SCO logo and SCO OpenServer are trademarks or registered trademarks of The Santa Cruz Operation, Inc. in the USA and other countries. UNIX is a registered trademark in the United States and other countries, licensed exclusively through X/Open Company Limited. Netscape, Netscape Communications Server, and Netscape Navigator are trademarks of Netscape Communications Corporation. All other brand and product names are or may be trademarks of, and are used to identify products or services of, their respective owners. The Santa Cruz Operation, Inc. reserves the right to change or modify any of the product or service specifications or features described herein without notice. This summary is for information only. SCO makes no express or implied representations or warranties in this summary. ©1996 The Santa Cruz Operation, Inc. All Rights Reserved.

Introducing three things you might not expect from Motorola.

StarMax *for Mac OS* PowerStack II *for Windows NT and AIX*

©1996 Motorola, Inc. All rights reserved. Motorola and ® are registered trademarks of Motorola, Inc. PowerPC and the PowerPC logo are trademarks of International Business Machines Corporation, used under license therefrom. All other brand and product names are the trademarks or registered trademarks of their respective holders. BYTE magazine, August 1996, used with permission.

Mac OS, Windows NT and AIX. All now available with PowerPC performance.

Motorola? Making computers? Of course. After all, we've been in the computer business for years, manufacturing everything from microprocessors to motherboards. Truth is, all computers ought to be manufactured and serviced as well as ours are. And with the only five-year warranty in the computer industry, we're making Motorola the name to look for in systems and servers—just like you do for every other Motorola product innovation.

PowerPC™

And one you would.

the Motorola name stands for quality and innovation in everything we do. So leave it to us to introduce the very first line of computers that includes Windows NT,® AIX® and Mac® OS-based computer systems. All with the distinct advantage of running on the PowerPC™ microprocessor—the one that outperformed Pentium® and Pentium® Pro processors in a recent BYTE *magazine performance test!*

The industry's only five-year system warranty.

Our quality is famous. Our warranty unmatched. This is our way of saying that

Industry-low pricing.

A five-year system warranty on a powerful line of systems running on the PowerPC architecture. And as always, we're competitively priced. Now that's one thing no one expects these days. The fact is, these are among the industry's lowest-priced systems of this quality and power. Which brings us to yet another thing you'd expect from us: an easy way to get more information. Call and ask how you can order any of our complete line of systems and servers. We'll be expecting your call.

PowerStack™ II systems for Windows NT and AIX.
StarMax™ systems for Mac OS.

MOTOROLA
Computer Group

What you never thought possible.™

INTELLIGENT STORAGE HUB

FOR EVERYONE WHO'S BEEN WAITING PATIENTLY FOR FASTER NETWORK STORAGE.

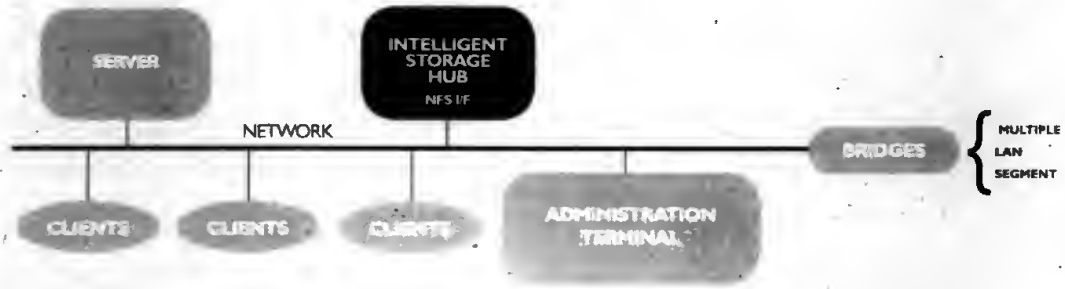
HOW DOES 50% FASTER SOUND? Probably like a dream for those seeking a smarter way to manage data. In that case, the Symbios Logic MetaStor SH4000 intelligent storage hub is a dream come true. It's a new storage system that attaches directly to your network and significantly increases throughput. Better still, it's from Symbios Logic, a leader in storage technology.

METASTOR™

The solution to managing data across large networks isn't as simple as adding disks or a new server, because general-purpose file servers aren't optimized for centralized storage. The MetaStor SH4000 intelligent storage hub is. It's all about I/Os and an astounding NFS Ops of 1,350. While storing up to 252 GB, it supports more users and reduces response time. It eliminates bottlenecks, automatically backs up and restores, conserves network resources and controls costs.

And the dream gets even better. Because the intelligent storage hub includes high-bandwidth RAID, an industry-leading 99.99% data availability, and an integrated five-DLT-drive tape array for 400% faster backup. And to meet future needs, it's designed for easy expansion.

So if you've been waiting for centralized storage with blazing I/Os, relax. The MetaStor SH4000 intelligent storage hub is here. To learn more, call Symbios Logic at **1-800-86-ARRAY**, or visit our Web site at http://www.symbios.com.



The MetaStor intelligent storage hub attaches directly to your network, increasing data throughput by up to 50 percent.

SYMBIOS LOGIC

The Storage Connection

© 1996 Symbios Logic Inc. Symbios Logic and MetaStor are trademarks of Symbios Logic Inc.

Sound Off!

Routers will rout switches!

There's a new generation of routers. They're buffed, they're fit — and they're ready to get it on with any switch you've got.

Not long ago, routers were the weaklings of the data communications beach. Switches could kick sand in their faces, it seemed, with impunity.

Switches kept getting faster and faster, and routers appeared to be at the end of their technological life cycle. Routers were slow. Routers were clunky. Routers were wimpy. Asynchronous Transfer Mode (ATM) and Synchronous Optical Network (Sonet) — the new high-speed, fiber-optic-based network infrastructure — were expected, and routers simply wouldn't be able to keep up.

BY SCOTT MARCUS

No more!

A new generation of routers has arrived on the scene. They're tougher, meaner, stronger. They've been working out and taking steroids. And they're ready to take on all co ders.

In reality, there was never a question of routers going away. It always was clear that routers were needed for wide-area networks. The real question was, and still is: In the WAN, is it better to use a mix of routers and switches or to use routers alone? Can the routers go the distance in the wide-area environment, or do they need

Routers will rout switches, *page 97*

Switches will rout routers!

Networks have changed over the years. Unfortunately, the basic technology of the router hasn't. Today's networks have evolved into high-speed, complex, heterogeneous systems. And with the exponential growth of the Internet and corporate intranets, users are accessing information outside their local workgroups or subnetworks more and more.

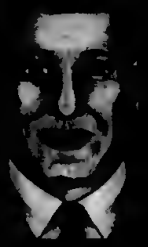
While routers have become bigger and faster — and consequently more expensive — their fundamental operational principle of connectionless, packet-by-packet, hop-by-hop decision-making hasn't allowed them to keep pace with technologies such as Fiber Distributed Data Interface, Fast Ethernet and Asynchronous Transfer Mode. Switches, in contrast, offer predictable, reliable communications because they're based on end-to-end communications without the need to "route" every packet.

BY TRENT WATERHOUSE

Since the mid-1980s, routers have provided the best solution to a variety of network issues. But today, network architects recognize that routing provides the value they need and that both routers

Switches will rout routers, *page 97*

Spare me. Switches have got all the moves — price/performance, speed, flexibility. I pity the fool router that'll climb in the ring with them.



YOUR CAREER IS RESULTS-ORIENTED.

YOUR COMPANY IS RESULTS-ORIENTED.

YOUR WEBSITE IS...UH OH.

Lotus

Intel Pentium® Processor up to 133MHz
Up to 16MB EDO DRAM
Up to 1.09GB hard drive
11.3" DSTN color display
AND FEEL THE DIFFERENCE

Yes, I want to receive my subscription of **COMPUTERWORLD** each week. I accept your offer of $39.95* per year - a savings of over 73% off the single copy price.

First Name MI Last Name

Title Company

Address City State Zip

Address Shown ☐ Home ☐ Business ☐ New ☐ Renew Single copy price: $3.00/issue *U.S. Only. Canada $95, Mexico, Central/South America $150. Europe $295, all other countries $295

Please complete the questions below.

1 BUSINESS/INDUSTRY (Circle one)
10. Manufacturer (other than computer)
20. Finance/Insurance/Real Estate
30. Medical/Law/Education
40. Wholesale/Retail/Trade
50. Business Service (except DP)
60. Government: State/Federal/Local
65. Communications Systems/Public Utilities/Transportation
70. Mining/Construction/Petroleum/ Refining/Agriculture
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90. Computer/Peripheral Dealer/Dist./ Retailer
99. Other_____ (Please specify)

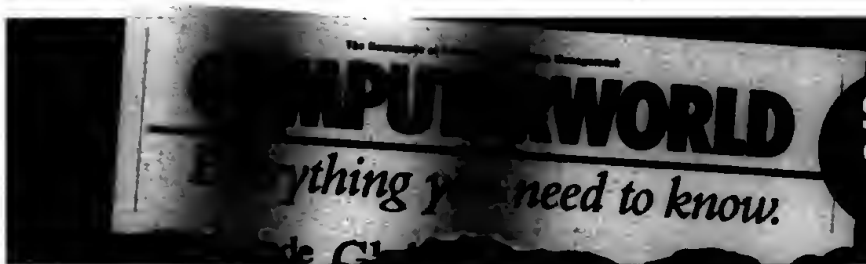
2. TITLE/FUNCTION (Circle one)
IS/MIS/DP MANAGEMENT
19. Chief Information Officer/Vice President/ Asst. VP IS/MIS/DP Management
21. Dir./Mgr. MIS Services, Information Center
22. Dir./Mgr. Network Sys., Data/Tele Comm., LAN Mgr. /PC Mgr. Tech Planning, Administrative Services
23. Dir./Mgr. Sys. Development, Systems Architecture
31. Programming Management, Software Developers
41. Engineering, Scientific, R&D, Tech. Management
80. Sys. Integrators/VARs/Consulting Mgt.
CORPORATE MANAGEMENT
11. President, Owner/Partner,General Mgr
12. Vice President, Asst. VP
13. Treasurer,Controller, Financial Officer
DEPARTMENTAL MANAGEMENT
51. Sales & Mktg. Management
70. Medical, Legal, Accounting Mgt.
OTHER PROFESSIONAL MANAGEMENT
60. Information Centers/Libraries, Educators, Journalists, Students
90. Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)
Operating Systems
(a) Solaris (e) Mac OS
(b) Network (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep
App. Development Products ☐ Yes ☐ No
Networking Products ☐ Yes ☐ No

4. How many people are employed at this location and in your entire organization, including all of its branches, divisions and subsidiaries? (Select only one per column.)

	1. At this location	2. Entire Organization
A. 20,000 +	☐	☐
B. 10,000 – 19,999	☐	☐
C. 5,000 – 9,999	☐	☐
D. 1,000 – 4,999	☐	☐
E. 500 – 999	☐	☐
F. 100 – 499	☐	☐
G. 50 – 99	☐	☐
H. 20 – 49	☐	☐
J. 10 – 19	☐	☐
K. 1 – 9	☐	☐

B496 2



Yes, I want to receive my subscription of **COMPUTERWORLD** each week. I accept your offer of $39.95* per year - a savings of over 73% off the single copy price.

First Name MI Last Name

Title Company

Address City State Zip

Address Shown: ☐ Home ☐ Business ☐ New ☐ Renew Single copy price: $3.00/issue *U.S. Only. Canada $95, Mexico, Central/South America $150. Europe $295, all other countries $295.

Please complete the questions below.

1 BUSINESS/INDUSTRY (Circle one)
10. Manufacturer (other than computer)
20. Finance/Insurance/Real Estate
30. Medical/Law/Education
40. Wholesale/Retail/Trade
50. Business Service (except DP)
60. Government: State/Federal/Local
65. Communications Systems/Public Utilities/Transportation
70. Mining/Construction/Petroleum/ Refining/Agriculture
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90. Computer/Peripheral Dealer/Dist./ Retailer
99. Other_____ (Please specify)

2. TITLE/FUNCTION (Circle one)
IS/MIS/DP MANAGEMENT
19. Chief Information Officer/Vice President/ Asst. VP IS/MIS/DP Management
21. Dir./Mgr. MIS Services, Information Center
22. Dir./Mgr. Network Sys., Data/Tele Comm., LAN Mgr. /PC Mgr. Tech Planning, Administrative Services
23. Dir./Mgr. Sys. Development, Systems Architecture
31. Programming Management, Software Developers
41. Engineering, Scientific, R&D, Tech. Management
80. Sys. Integrators/VARs/Consulting Mgt.
CORPORATE MANAGEMENT
11. President, Owner/Partner,General Mgr
12. Vice President, Asst. VP
13. Treasurer,Controller, Financial Officer
DEPARTMENTAL MANAGEMENT
51. Sales & Mktg. Management
70. Medical, Legal, Accounting Mgt.
OTHER PROFESSIONAL MANAGEMENT
60. Information Centers/Libraries, Educators, Journalists, Students
90. Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)
Operating Systems
(a) Solaris (e) Mac OS
(b) Network (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep
App. Development Products ☐ Yes ☐ No
Networking Products ☐ Yes ☐ No

4. How many people are employed at this location and in your entire organization, including all of its branches, divisions and subsidiaries? (Select only one per column.)

	1. At this location	2. Entire Organization
A. 20,000 +	☐	☐
B. 10,000 – 19,999	☐	☐
C. 5,000 – 9,999	☐	☐
D. 1,000 – 4,999	☐	☐
E. 500 – 999	☐	☐
F. 100 – 499	☐	☐
G. 50 – 99	☐	☐
H. 20 – 49	☐	☐
J. 10 – 19	☐	☐
K. 1 – 9	☐	☐

B496 2

NO POSTAGE. NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 55B MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD
P O BOX 2044
MARION OHIO 43306-4144

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 55B MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD
P O BOX 2044
MARION OHIO 43306-4144

Routers will rout switches

CONTINUED FROM PAGE 93

help from a layer of switches?

Just a year ago, the answer seemed clear-cut in favor of the hybrid router/switch solution. Today, the answer seems equally clear-cut *against* switches. Largely unnoticed, routers have benefited from a fast-paced infusion of technology. They have evolved. They have turned the tables. Routers have taken the lead this year in price/performance in comparison with WAN switches, and all indications are they will hold that lead.

Yes, carriers will continue to use switches to sell public switched services such as frame relay, Switched Multimegabit Data Service and ATM, but enterprises and Internet service providers no longer need to deploy their own WAN switches to supplement their routers.

Today, a pure routed WAN solution offers better price/performance and better reliability than a hybrid switch/router solution.

In the bad old days, routers were thought to suffer from high cost per port, limited switching capacity and limited ability to scale to high speeds, high delay on each hop, and poor manageability and reliability.

But things have changed. Routers now offer better price per port than switches. Routers have just blown by switches in terms of WAN port density (the number of ports per box and per interface card), resulting in a real edge in price/performance. Higher port density means fewer boxes to run a network of a given size, which results in lower costs for field service, software maintenance, space, power and network management personnel.

Just a year ago, Cisco Systems, Inc.'s high-end routers were limited to five slots for interface cards — far too few. Today's Cisco 7513 offers 11 interface slots, which is competitive with WAN switches.

Port density has an enormous impact on price/performance. You can buy your beer by the can, the six-pack or the case — but you pay a big premium when you buy by the can. Things are cheaper by the dozen.

In the past, sophisticated switch vendors such as Cascade Communications Corp. obtained much of their price/performance advantage by incorporating functionality from channel and digital service units directly into their switches. This way, they avoided the cost and hassle of large numbers of external boxes. They also obtained an advantage by multiplexing many low-bandwidth lines into a single switch port, thus enhancing port density and reducing telecommunications charges.

But new advances in multiplexing allow a single Cisco 7513 router to support more than 350 circuits at less than $1,000 per port. For the first time, routers have the edge when it comes to multiplexing, which has a huge effect on economics. Even the most capable WAN switch vendors will be hard-pressed to catch up to this price/performance.

Routers have plenty of switching power. Today's routers can keep up with the fastest lines in common use and have ample switching power for all but the most exotic applications.

Router vendors have taken a page from the switch vendors' book. The centralized, monolithic high-end router architectures of just a few years ago are rapidly evolving into switch-like parallel distributed multiprocessor architectures. A convergence is taking place. The new generation of routers looks more switch-like, just as the switches are starting to look more router-like.

A pure routed solution provides excellent end-to-end delay. The old canard that router hops are expensive in terms of delay was mostly based on the belief that routers switch more slowly than switches. But today's routers can keep up with the fastest transmission lines you can get — switches can't do any better because they can't move data faster than the speed of the line. Today, you'd be better off reducing switch hops than router hops.

A pure routed solution provides sound reliability and manageability. Adding a layer of WAN switches doesn't improve manageability — it degrades it. You still need the routers.

There's a new bully on the data communications beach. For the overwhelming majority of enterprise networks in the wide area today and for the foreseeable future, a pure router network will give you better performance and better reliability at lower cost than a comparable switch/router network. ■

Routers have plenty of switching power.

Marcus is director of network architecture at BBN Corp. in Cambridge, Mass., and is author of *How to Design Wide Area Networks*, to be published by Addison-Wesley Long next year.

Switches will rout routers

CONTINUED FROM PAGE 93

and switches can provide routing services. In fact, switches can handle routing — at much lower cost and much higher performance.

Routing is required in every network. So why should it be centralized on a single device called a router? Switches can distribute the essential routing functions closer to the user on every port. In a switched environment, not only is routing spread network-wide — vastly improving scalability — but it also increases fault tolerance because the failure of one device no longer affects all users on all subnetworks.

Networks should mirror the organizations they support. Switches deliver.

So where does the router belong today? The premise that it's the ideal solution for Internet and wide-area network access is being called into question. After all, if the Internet is to be as ubiquitous and easy to use as the telephone system, shouldn't it be built with the same switch technology as the phone system? Witness the recent catastrophic failures of large router-based service providers: Netcom On-Line Communications Services, Inc. lost 400,000 users for 13 hours because of a router configuration typographical error; America Online dropped 6 million users for 19 hours, a gaffe that cost the company at least $3 million.

Contributing factors to these highly visible Internet blackouts (and daily brownouts) begin with the router's extreme complexity. Routers typically employ cryptic configuration and management tools, and they require manual intervention every time there's a move, addition or change to the network. Switches, on the other hand, deliver plug-and-play automation to support changing network dynamics.

Router manufacturers have aggressively embraced switching. They're trying to force-fit application specific integrated circuit (ASIC)-based hardware switching modules into router boxes. And in the past few years, they've been acquiring every switch company in sight.

But their solutions fall short: Any way that you dress it up, it's still a router-based solution that they offer.

Routers have forced users to artificially organize networks based on physical location or the number of floors in a building. Networks should mirror the business organization structure they are deployed to support. Switches deliver this flattened, virtual routing flexibility and mobility.

Router platforms also deliver significantly lower performance. Routers are increasingly demonstrating their inability to keep pace with Internet bandwidth requirements. LANs and intranets generate hundreds, even thousands, of times more information delivery requirements than the Internet. Today, the network is a business tool; if it fails or doesn't scale proportionally with business needs, significant downtime and lost-opportunity costs result.

The leading ASIC-based router on the market offers 2G bit/sec. of bandwidth and 1 million packet/sec. of throughput. Next-generation routers, anticipated in 1997 and 1998, will offer more than 60G bit/sec. and a few million packet/sec.

Yawn.

There have been switches on the market since 1994 that offer 75G bit/sec. of bandwidth and 10.5 million packet/sec.

What about cost? It isn't all about what the purchase order is written for; there are operational costs to consider as well. The Dell'Oro Group projects that next year switched Ethernet ports will cost an average of $293 per port, and switched Fast Ethernet will average $583 per port. Routed Ethernet is projected at $2,040 per port and Routed Fast Ethernet at $4,319.

Moving from a router-based solution to a switched solution isn't necessarily an all-or-nothing decision. Smart switching vendors design their platforms to be 100% compatible with highly routed and highly subnetted environments. In fact, many large organizations such as the New York Power Authority and the Chicago Board Options Exchange find that switches improve the performance of their router-based networks. This enables them to delay or even avoid the costs of forklift upgrades to next-generation router platforms.

It all comes down to the business value proposition. Organizations can continue investing in the familiar routers and face an endless cycle of capacity and performance forklift upgrades every 18 to 24 months, or switch to a faster, more reliable, scalable, proven solution: switches with embedded routing. ■

Waterhouse is program manager of LAN switching at Cabletron Systems, Inc. in Rochester, N.H.

Windows NT is one operating system that IS pros can really build a career on

By Leslie Goff

Taking your career to the NTth degree

ACROSS THE INFORMATION SYSTEMS ORGANIZATION — in networking and operations, at the help desk and on application development teams — Windows NT skills have acquired a cachet that is earning IS professionals higher pay and visibility. For independent IS contractors, Windows NT skills are making the difference between busy and busted.

With Microsoft Corp. positioning its network operating system as the enterprisewide successor to the Windows 95 throne, Windows NT is becoming a ubiquitous component of client/server installations. Demand for NT experience among permanent and temporary staff is outpacing supply, IS managers say.

"I get about eight phone calls for NT projects on a quiet day," says Harry Frizzell, an independent IS consultant based in Houston who specializes in Windows NT conversions. "One day, right after I posted my resume on the Internet, I got 30 to 35 calls and 20 pages on my beeper."

In fact, Windows NT topped the list of the most in-demand operating systems talent in *Computerworld*'s 1996 IS Skills Survey, to be published in November. Of 804 respondents, 36% said they plan to hire staffers with Windows NT skills.

The survey also revealed that NT skills command a premium. On average, full-time IS staffers who have NT experience earn 9% more and IS contractors earn 11% more than IS professionals who don't.

ABN-Amro Services Co., the IS arm for the North American subsidiary of Dutch banking concern ABN-Amro, recently implemented NT for critical retail-banking applications. But a skills gap resulted in increasing the end-user support staff by 25% in 18 months, according to Mike Shelley, vice president of end-user computing. He is having existing staffers trained in NT and employing temporary contractors.

"We're doing whatever we have to to get the job done. We need people who know and understand NT, Microsoft Domain Services and the 32-bit desktop applications, as well as how to integrate existing 16-bit software products into a 32-bit environment," Shelley says. "We look for people who can design, configure and support a large-scale NT implementation and the products to go along with it." This includes shrink-wrapped end-user applications such as Microsoft Office and enterprisewide systems management software such as Computer Associates International, Inc.'s Unicenter/NT bundle, he says.

Network size an issue

Shelley's staff requirements are exacerbated by the size of the network. Supporting 5,000 users, including 3,000 loan officers, tellers and other bank employees in two states, it integrates multiple operating systems and hundreds of servers. Shelley says he has to toss out about 80% of the resumes he receives because the applicants lack the requisite corporate experience to accommodate the scope of the implementation.

The Dallas office of 1-800-Network, a temporary IS placement and recruitment firm, gets daily requests for Windows NT professionals from clients in all industry segments, says Doug Griffith, assignment manager at the company. Most are looking for what he calls a "super administrator," or someone who can perform routine network administration, such as adds, deletes, backups and upgrades, plus either end-user support or network diagnostics and troubleshooting.

"I wouldn't tell anyone to hang their career on one [product], but Windows NT is one that can anchor a career right now," Griffith says. "It can serve as an entry point."

Dan Caruthers, an independent consultant working on an NT-based mobile, executive-decision support system at Sprint Corp., says he has been able to leverage his NT experience to carve out a terminally busy schedule since moving to Dallas in 1994. His first contract position, which was at Electronic Data Systems Corp.'s internal IS organization, introduced him to Windows NT Version 3.5, and he hasn't had more than a week or two of downtime between jobs since.

NT resources

For more information on Microsoft Windows NT certification or to find a local authorized training education center that offers certification courses and exams, call (800) SOL-PROV.

Online training

The Microsoft Online Institute
[illegible]
or on The Microsoft Network, type "the MOI"

Unofficial NT Web sites

Windows NT Interactive Archive
[illegible]

The BHS Windows NT Resource Center
[illegible]

Windows-NT.com
[illegible]

Selected newsgroups

[illegible]

FAQs

Windows NT 3.5 FAQ
[illegible]

Windows NT Administration FAQ
[illegible]

Seeing the light

As many as 79,353 IS professionals have acquired some form of Windows NT certification, according to Microsoft in Redmond, Wash.

18,257 are Microsoft Certified Product Specialists/Networking

11,459 are Microsoft Certified Network Engineers

30,542 have passed Windows NT Workstation exams

19,095 have passed Windows NT Server exams

Shining stars

Windows NT professionals will be all the rage next year. Consider what IS hiring managers are planning:

Give us more
36% will hire Windows NT talent

Give *them* more, too
9% salary premiums will be paid to in-house NT talent

11% salary premiums will be paid to contract NT talent

Source: Computerworld's In Channing Nov. 18 annual skills survey

"I've been able to double my hourly billing rate in two years," Caruthers says. "I attribute most of that directly to NT. But my real goal is diversification in my skill sets, with NT as the [base]."

Since Windows NT is usually implemented in a heterogeneous environment, NT professionals must be trained in multiple disciplines, Shelley says. Skills sets that complement NT and create sought-after applicants include the following:

- Knowledge of other network operating systems, including Novell, Inc.'s NetWare, IBM's LAN Manager, Banyan Systems, Inc.'s Vines and Digital Equipment Corp.'s Pathworks, as well as desktop operating systems such as Windows 95, Windows 3.1 and OS/2.
- Familiarity with network protocols and hardware.
- Experience with network management software such as Hewlett-Packard Co.'s OpenView, CA's Unicenter or Microsoft's Systems Management Server.
- Help desk expertise.
- Functional business-area experience.

While application developers can get by on a basic understanding of how NT works and its user interface, deep experiences are required at the help desk and network infrastructure levels.

"What I've noticed is that experience goes a long way," Caruthers says. "I've seen certified people who haven't done the real-world applications, and they have to relearn things in the field. So, experience has been equal to certification.... But any education adds credibility; you can't deny that." ■

Goff is a freelance writer in New York.

Develop Your Career With BETA systems

We are a leading international software vendor offering comprehensive solutions for large MVS data centers. BETA Systems Software, Inc. is currently expanding North American operations at our corporate headquarters in Atlanta. Our rapid growth has us looking for immediate applicants for the following positions:

Technical Support Specialist
Strong MVS systems Programmer or Operations/Production background, with a high degree of interpersonal, analytical and phone skills.

Customer/Pre-Sales Consultant
Experienced Production Control or Operations Leaders. Customer oriented individuals, with strong communications and presentation skills.

Sales Executive
Successful sales professionals with knowledge of the MVS market.

Technical Writer
Must have strong communication skills and experience in documenting software products or applications.

UNIX Developers
Familiar with writing systems management applications and operating system interfaces.

MVS Developers
Experienced systems level Assembler and/or C programming.

Galaxy Developers
Experienced in C and C++ development using Galaxy Environment.

Mail or Fax your Resume & Salary Requirements to:
BETA Systems Software, Inc.
Human Resources
3490 Piedmont Road, Suite 1100 Atlanta, GA 30305
Tel.: (800) 777-9864 Fax: (404) 812-1563

Gibraltar Consulting Group, Inc.

WE FIND JOBS
for
Information Systems Professionals

Permanent & Contract
Salaries from 35k-125k

- Fortune 500 Companies
- P/A's to VP/CIO
- Excellent Salaries
- Great Benefits
- 150+ Positions Available

Call Today or Fax Resume:
1-800-749-7585 / Fax 615-383-7091
HTTP: www.gibraltar.com

SAP

WORLDWIDE IMPLEMENTATIONS

ALL MODULES
Functional • Technical
ABAP • BASIS
Positions throughout the U.S.

Structured Logic Company, Inc.
5200 Interstate N. Pkwy. #400
Atlanta, GA 30328
800/598-9550
FAX: 770/937-0423
e-mail: slc11@aol.com
EOE MEMBER NACCB

SAP Consultant for project management of computer systems including analysis of client's business operations, training client's professional staff, adapting SAP integrated business software for mainframes and for open UNIX platforms R/3 module consisting of 13 SAP modules including RV, RIM-MAT and RM-PPS and RK to client's operating environments. Confer with SAP Corporation headquarters in Germany on a regular basis. Travel to client sites every week. Requirements: B.S in Industrial Engineering or Computer Science. Must speak and read German. Travel to client sites throughout the U.S. Monday-Friday and return home for the weekend. Experience 4 years in the job offered or 4 years as an Engineer or Computer Scientist. Experience must include SAP training with RV, RIM-MAT, and RM-PPS implementing SAP systems. Use of R/2 and R/3 modules. SAP training with BC, LO, PP, PI modules. 40 hrs/wk; 8:00 a.m. to 5:00 p.m., $90,000.00/yr. Send resumes (in duplicate) to Ms. Cathy B. Phillips, E&T Technical Services, SCESC-SC2000591, PO Box 1406, Columbia, SC 29202. Those who are not legally authorized to work permanently in the United States need not

---

Computer Software Developer. Will design and develop Graphics User Interface (GUI) for an Object-Oriented, asset-level lease application processing system in MS Windows and UNIX. Will create and maintain relation-al data model of the system in Sybase for UNIX using Structural Query Language (SQL). Will design and implement Object Classes in Forte, a distributed, object-oriented, visual programming environment. Will develop, test and maintain software for applications developed on PC's, and IBM RS6000 UNIX using C++, C and UNIX Shell Script language. Will develop business-rule interpretations for workflow system. The applicant must have a Bachelor of Science in Computer Science. Academic course-work or projects must show use of C, C++, UNIX Shell Script and UNIX environments and Graph-ics User Interface. Must have a minimum of 3 credit hours in each of the following courses: theory and design, programming languages, intro to artificial intelli-gence, intro to programming lan-guages and compiler and data-base management systems. This is a full-time position (40 hours per week, 8 a.m. to 5 p.m. Mon-Fri) with an annual salary of $35,000. Must have proof of legal authority to work permanently in the U.S. Any interested candidate should send 2 copies of the resume and cover letter to: Illinois Department of Employment Security, 401 South State Street, 3 South, Chicago, IL 60605. Attention: Sheila Lindsey. Refer-ence # V-IL 15589-L. AN EMPLOYER PAID AD. NO CALLS. SEND 2 COPIES OF BOTH RESUME AND COVER LETTER.

PROGRAMMER ANALYST (2 positions) 40 hrs./wk. 8am-5pm $40,500/yr. Carry out design, programming, testing, mainte-nance and quality review of IBM 3090 mainframe-based soft-ware applications utilizing DB2, CICS, COBOL II, QMF and JCL. Reqr Bachelor's degr in Com-puter Science, Computer Appli-cations, Electrical or Mechanical Engrng and 1 yr. expr. in job offered or 1 yr. expr. in Systems Analyses &/or S/W Engineering &/or Programming &/or Com-puter Consulting. Reqr work experience in development of S/W applications and with DB2, CICS, COBOL II, QMF and JCL. Employer is S/W development/ consulting firm. Relocation to client sites throughout the U.S. for periods of & mos to 2 yrs. required. "Employer paid ad". E.O.E. Send resumes to: 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref #123896

PROGRAMMER ANALYST (2 openings) Plan, develop, test & document computer programs, applying knowledge of program-ming techniques & computer systems, evaluate user requests for new or modified programs to determine feasibility, cost & time required, compatibility with cur-rent system & computer capabil-ities; consult with users to identi-fy current operating procedures & clarify program objectives, for-mulate plan outlining steps req'd. to develop program using struc-tured analysis & design, convert project specifications, using flowcharts & diagrams into sequence of detailed instruc-tions & logical steps for coding into language processable by computer; apply knowledge of computer programming tech-niques & computer language, analyze, design, develop, code, test, implement & maintain a computerized information sys-tem on IBM mainframe environ-ment using relational database & using each of the following: DB2, IBM 3090, MVS/ESA (TSO/ISPF), CICS, VM/ESA (CMS), SQL/DS, CSP, VS COBOL II, CICS-COBOL, JCL, ReXX & CMF. Reqs: Bachelor's in Computer Science, Systems Engineering, Computer Information Systems, Computer Engineer-ing, Electrical Engineering, Electronic Engineering, Mathe-matics or its equiv in ed. & exp., 2 yrs. exp. in job offered or 2 yrs. exp. in related occup. such as Programmer, Programmer Analyst, Systems Analyst, Software Engineer or Consultant. Will accept 5 yrs. of college ed. plus 3 yrs. exp. in the job offered or in a related occup. In lieu of the req'd. ed. & exp. Some of the related exp. must include analy-sis, design, development, testing & implementation & using each of the following: DB2, VS COBOL II, JCL, CICS, CSP and MVS/ESA (TSO/ISPF). $46,000/yr, 40 hrs/wk, 9a-5p. Send resumes to 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Include Ref # 119796. Employer Paid Ad.

Senior Systems Analyst - Design, develop, implement, analyze and modify sophisticated customized SAP R/3 Materials Management and Production Planning Soft-ware Systems for use by large multi-divisional operating Cor-ter with clients in analyzing oper-ational software procedures, requirements and products to improve existing software com-puter systems, and identifying and resolving system-specific issues. Design and modify com-puter software system and func-tional specifications as required for various modules. Implement software design changes accord-ing to client objectives. Create user documentation require-ments, generic user documenta-tion for use by end-users, and module applications systems testing methodology. Other duties and responsibilities include but are not limited to providing high-level technical advice and training to on-site Systems Analysts, Programmers, and professional computer staff; and documenting assigned phases of each aspect of software design. Require-ments: B.S. degree in Computer Science or related discipline, and one (1) year work experience in SAP R/3. Must be knowledgeable and proficient in SAP R/3 soft-ware systems, and highly spe-cialized computer software sys-tems applications. 40 hrs./wk., Mon.-Fri., 8 a.m. - 5 p.m., $120,000/yr. Send resume to: CW-182718, Computerworld, Box 9171, Framingham, MA 01701-9171 or fax to 508-620-7739 referencing CW-182718.

Systems Analyst - Analyze, design, develop, test, imple-ment info. Mgment Systems using Object Oriented Technology using UNIX, C++, C and ORACLE Database. 40 hrs/wk; 8AM-5PM; $60,000/yr. Req. Bach. in Comp. Sci., Math or any Engineering & 2 years exp. Employer is a computer con-sulting firm. Relocation to var-ious client sites for periods of 6 months to 2 years is required. Send resume to Job Service of Florida, 1001 EXECUTIVE CENTER DRIVE, ORLANDO, FL 32803-3520. Re: Job Order Number FL-1494192.

PROGRAMMER ANALYST (2 openings). Plan, develop, test & document computer programs, applying knowledge of program-ming techniques & computer systems; evaluate user requests for new or modified programs to determine feasibility, cost & time required, compatibility with cur-rent system & computer capabil-ities, consult with users to identify current operating procedures & clarify program objectives; formu-late plan outlining steps req'd. to develop program using struc-tured analysis & design; convert project specifications, using flow-charts & diagrams into sequence of detailed instructions & logical steps for coding into language processable by computer; apply knowledge of computer programming techniques & computer lan-guage, using case tools for analy-sis, design & development; requirement analysis, logical data modeling, defining automa-tion boundaries & arriving to physical model of the system; process modeling, physical data-base design & functional decom-position of the process design & development of applications using CICS on IBM 3090 & using each of the following: IBM 3090, DB2, CICS, COBOL, CLIST, TSO/ISPF, IEF & MVS/ESA. Reqr. Bachelor's in Computer Science, Systems Analysis, Computer Information Systems, Computer Engineering, Electrical Engineering, Electronic Engineer-ing, Mathematics or its equiv to ed. & exp., 2 yrs. exp. in job offered or 2 yrs. exp. in related occup. such as Programmer, Programmer Analyst, Systems Programmer, Systems Analyst, Senior Systems Analyst, Soft-ware Engineer, Module Leader or Consultant. Will accept 5 yrs. of college ed. plus 3 yrs. exp. in the job offered or in a related occup. In lieu of the req'd ed. & exp. Some of the related exp. must include using Case tools for analysis, design & development & using each of the following: DB2, CICS, COBOL, CLIST & TSO/ISPF. $48,000/yr, 40 hrs/wk, 9a-5p. Send resumes to 7310 Woodward Ave., Rm. 415, Detroit, MI 48202 & include Ref.# 119666. Employer Paid Ad.

Software Developer to analyze, design & implement client server systems such as project planning information navigator, production control systems, system analysis required at customer sites & de-velopment of graphical user inter-face and relational database man-agement systems applications, telecommunications systems, I&DN & real time systems in HPUX, SunOS, AIX, MS windows, & Novell. 40 hrs/wk; salary $45,000/year. Requires M.S. in computer science & 2 years expe-rience in design & development of client server based data base sys-tems with structured analysis/ob-ject-oriented analysis & design approach; must have experience using object oriented methodol-ogy (Booch-Rumbaugh, developing network applications, use of struc-tured methodology and computer languages such as C, C++, Visual Basic, Visual C++, Small Talk, and Parallel C for implementing client & the server portion of data base system such as Oracle 7.0, Informix, MS Access, Pro*C, SQL* & Protel-2. Will accept 2 yrs. As Systems Analyst, duties to have included above. Must be el-gible to work in U.S. Send resume with SS# to Job Service, 1105 Briggs Avenue, Durham, NC 27703, or your nearest Job Service Office. Refer to Job Order number NC3080940.

DATABASE EXPERTS

Interesting or hectic work challenges?
We have outstanding positions for
DBA's & DB developers.
All DBA / Data & Focus Paid

Sr. DB Expert to $85k
Fifth comp. seeks exp. with multiple RDBMS for prog Database expert in optimizing & integration

Data Warehousing to $75k + stock
Oracle/User Project Mgr with strong technical & interview skills

Oracle DBA to $70k
Oracle 8 User or Windows for development of large systems

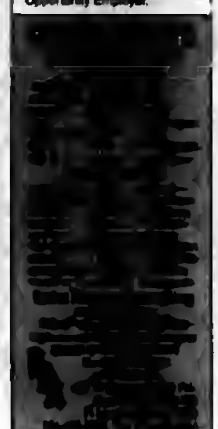
Also:
Database Integrate @ C++ to $70k
Client/Server & Sybase to $65k
Oracle/Mainframe/Reporting to $65k
GUI/Powerbuilder to $65k
Informix DBA to $60k

HAMILTON
TECHNICAL RESOURCES, INC.
P.O. Box 849 Westbury, NY 11591
516-679-4050 Fax: 516-679-5704
http@mhv.net
http://www1.mhv.net/~http/

PROGRAMMER ANALYST (2 openings): Plan, develop, test & document computer programs, applying knowledge of program-ming techniques & computer systems; evaluate user requests for new or modified programs to determine feasibility, cost & time req'd., compatibility with current system & computer capabilities; consult with users to identify cur-rent operating procedures & clarify program objectives; for-mulate plan outlining steps req'd. to develop program using struc-tured analysis & design; convert project specifications, using flowcharts & diagrams into sequence of detailed instruc-tions & logical steps for coding into language processable by computer; apply knowledge of computer programming tech-niques & computer language, analysis, design & development of an apportionment system; analysis for applications, devel-opment of systems; process control & data flow design, data modeling, development & testing of system modules, & technical support & using each of the fol-lowing: IBM 3090, MVS, CICS, DB2, COBOL II, IMS, VSAM & TSO/ISPF. Reqs: Bachelor's in Computer Science, Systems Analysis, Computer Information Systems, Computer Engin-eering, Electrical Engineering, Electronic Engineering, Mathe-matics or its equiv in ed. & exp.; 2 yrs. exp. in the job offered or 2 yrs. in a related occup such as Programmer, Programmer Analyst, Analyst/Programmer, Systems Analyst, Information Technology Officer, Software Engineer or Consultant. Will accept 3 yrs. of college ed. plus 3 yrs. exp. in the job offered or in a related occup. In lieu of the req'd ed. & exp. Some of the related exp. must include analy-sis for applications, development of systems & using each of the following: CICS, DB2, COBOL II, TSO/ISPF & IMS. 47,878.96/yr, 40 hrs/wk, 8a-5p. Send resumes to 7310 Woodward Ave., Rm. 415, Detroit, MI 48202 & include Ref.#123298. Employer Paid Ad.

Computer Consultant/Jr. Project Manager (Wauconda, IL) Analyze business procedures & computer systems & prepare software solu-tions to meet client needs. Lead team of 3-4 Computer Consul-tants in the design, development, testing & implementation of cus-tomized business systems soft-ware applications. Discuss sys-tems goals & proposed software design with leads of consultants. Delegate development responsi-bilities to computer consultants depending on individual experi-ence & skill level. Troubleshoot project problems. Oversee pro-jects involving the following com-puter-based methodologies: IBM 3090 mainframe, HP 9000 client/server technology, C & COBOL languages, MVS & HP-UX environments, IMS DB/DC database, VSAM, NETWISE, IMS DB/DC simulation of client database using COBOL & VSAM on an IBM Mainframe, & Impact Analyst using VIASOFT ALLIANCE. Evaluate & improve effectiveness of data handling systems & develop specifications for logical & mathematical opera-tions. Plan & prepare technical reports, memoranda & instruc-tional materials for operational systems software. Prepare status reports for client. Travel to client sites throughout the U.S. 25-50% of the time. 40 hrs./wk; 8:30am-5pm, $66,850/Yr. Must have a Bachelor's in Computer Science or in a related field such as: Engrg., Math, Physics, Chemis-try, MIS or Business. Must have 4 yrs exp to the job offered or 4 yrs exp as a Computer Software Development Specialist (Programmer Analyst, Systems Analyst, Programmer Analyst or Software Engr). Must have a desire to manage software development team. Through education or work exp must have acquired software development skills in each of the following computer-based metho-dologies: 1) HP 9000 2)C 3) IMS DB/DC. 4) Simulation of client database using COBOL & VSAM on an IBM Mainframe, & 5) Impact Analyses using a tool such as VIASOFT ALLIANCE. Must be willing to travel to client sites throughout the U.S. 25-50% of the time. Send resume/ltr in dupl to Cathy Marsh, Vice President Human Resources, Kenbey Inc. 6688 North Western Ave., Chicago, IL 60645. Refer to job #10740.

SOFTWARE ENGINEER required. Design & development of database software using NATURAL, Adabas, COBOL, Adasel (Adabas SQL), PREDICT & CONSTRUCT. Extensive use of JCL, TSO/ISPF, CICS & MVS maintenance. Perform project planning & database design, develop user interfaces, provide user training & develop & support sys-tem test plans. Two years experience required in the job duties described above. Must have proof of legal authority to work in the U.S. Salary - $66,000/year for a 40 hour work week. Job site/interview - Colorado Springs, CO. Appli-cation is by resume only. Mail resumes to: Colorado Depart-ment of Labor & Employment, Employment Programs, Attn: Jon Shimada, Tower Suite 400, 1515 Arapahoe St., Denver, CO 80202-2117. Refer to Job Order Number CO 4464893. Ad paid by an Equal Opportunity Employer.



Object Oriented Programmer - Analyst, Bachelor's Degree re-quired. Minimum of two years expe-rience required in each of the fol-lowing: object-oriented analysis and software design; programming using PenPeace Smalltalk pro-gramming language and PenPeace development environment (ObjectWorks and/or VisualWorks); and using OODBMS or RDBMS (Object Oriented or Relational Database Management Systems) in object oriented soft-ware development. Successful completion of a minimum of one university course in mathematical analysis. The job involves building object oriented, client/server soft-ware for the retail and distribution industry. This software is written in PenPeace Smalltalk programming language using VisualWorks devel-opment environment and Data-base Management System (Rela-tional - RDBMS or Object Oriented - OODBMS). A programmer-Analyst is responsible for analyzing customer requirements and soft-ware features using object oriented methods, designing the architec-ture of the client/server and net-worked software program using object oriented, client/server tools and methods; coding new software using VisualWorks development environment and the PenPeace Smalltalk programming language; coding object oriented, synchronic programs in PenPeace Smalltalk programming language; generating advanced graphical user interfaces using VisualWorks development environment and the PenPeace Smalltalk programming language; testing object oriented, synchronic programs and the PenPeace Smalltalk programming language. Rate of Pay: $35,000 to $55,000. Hours per Week: 40. Send resume/inquiries to Job Order 9147, Oklahoma State Employment Service Office, 13401 N. Santa Fe, Edmond, Oklahoma 73114, ((405)513), Phone (405) 752-5627.

join the team at IDG

Over the past six years, IDG Books Worldwide has assumed a leadership role in publishing highly acclaimed computer and business books. Our growth has created these outstanding opportunities to join our team in Indianapolis.

Site Manager-LAN

In addition to assuming responsibility for LAN administration and WAN equipment for one site, the successful candidate will also provide systems support and manage/develop people. Requirements include 4+ years of experience (MS NT networking) and a BSCS or related degree. Excellent communication skills a must.

Manager, Order Services

You will work closely with a project team in charge of enhancing our customer service capability. This will involve defining, selecting, customizing and implementing a new transaction processing system, and developing and training a team in charge of order processing, customer service and basic technical support. A college degree, preferably in business administration or management, a background in managing major systems changes, and strong team building/leadership skills are required. The ability to thrive in a fast-paced, customer-driven setting is a must, as is knowledge of all aspects of order services. Preferred applicants will be familiar with software technical support and have a publishing background.

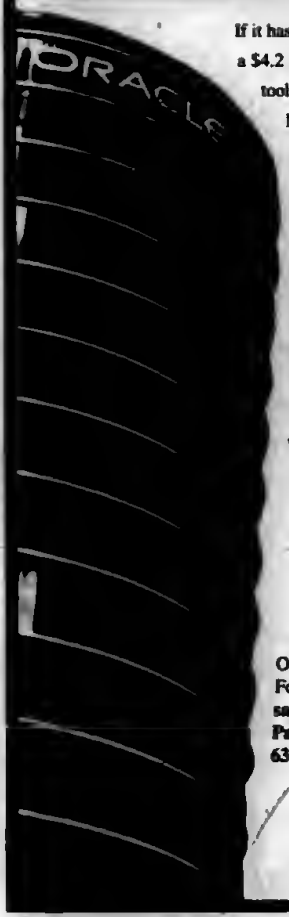
An excellent compensation and benefits package accompanies these positions. Please send/fax resume and salary requirements to: IDG Books Worldwide, Human Resources Manager, 7260 Shadeland Station, #100, Indianapolis, IN 46256; Fax: 317-596-5240. An equal opportunity employer.

Call our Job Line 1-800-434-2190 for additional opportunities.

Or visit our web site at http://www.idgbooks.com

More than a publishing phenomenon.

Experience Begins Here!



If it has to do with data, Oracle has more experience than anyone else. We've grown to be a $4.2 billion company, the world's largest independent supplier of database software and tools, and a leading developer of information management software/services. Besides last year's 40% growth in revenue, we've also grown to more than 23,000 employees in over 90 countries. And our future shows no sign of slowing.

Currently, we're looking to hire the very best to fill sales representative openings locally and in major cities across the U.S.

Sales Representatives

New Technologies Division - InterOffice Sales

We're seeking sales professionals who have a successful track record of 5+ years solutions sales experience with Fortune 500 accounts, preferably with Document Management, Groupware or Workflow Technologies.

We also have professional opportunities for:

Sales Consultants
Account Managers
Marketing Territory Managers
Alliance Marketing/Alliance Sales/Telesales

Oracle Corporation offers generous compensation and unparalleled benefits. For confidential consideration, send your resume to (e-mail preferred/ASCII text): **saqua@us.oracle.com Attn: I. Solonce Aqua, Oracle Corporation, 500 Oracle Parkway, Dept. 9/30CW, Box 659214, Redwood Shores, CA 94065. FAX (415) 633-3648.** Equal talent will always get equal opportunity. No phone calls, please.

ORACLE®
Enabling the Information Age™

Join us and be a part of THE solution

NATIONWIDE OPPORTUNITIES

Vanstar Corporation, a multi-billion dollar company and one of the world's largest network integrators is looking for skilled professionals to add to its highly talented dynamic team

ENTERPRISE COMMUNICATIONS CONSULTING ENGINEERS Must have experience in LAN/WAN consulting, configuration, and documentation. Knowledge of multiple protocols and high-end network products necessary. Experience in one or more of the following is required; Ethernet, Token Ring, FDDI, TCP/IP, IPX, SNA, Frame Relay, Hubs/Routers/Switches, Network Management Protocols & tools. RefPECCE

ELECTRONIC COMMERCE CONSULTANTS Must understand business applications and processes (i.e. order processing, purchasing, general ledger, etc). Must have 1-3 years implementation/design experience in electronic commerce-electronic data interchange systems. Requires 50% to 70% travel. Experience with multiple computer platforms highly desired. Strong written/presentation skills required. RefECC.

ENTERPRISE SYSTEMS CONSULTANTS Candidates must understand a number of ancillary tools and be able to solve business and technical problems for our diverse client base. Must have 2-3 years implementation/design experience in Windows NT, Windows for Workgroups, Windows 95 environments, as well as in non-Microsoft environments. Requires 50% to 70% travel. Strong written/presentation skills required. RefESC

SYSTEMS ENGINEERS-ALL LEVELS Experience in LAN/WAN consulting, configuration and documentation, and knowledge of multiple protocols and high-end network products required. We will train qualified engineers in products such as NT Server, SMS, SNA, and Mail. Training will lead to MCSE certification. RefSECW

If you are appealed a challenging, team-oriented environment, you are invited to be your resume with reference number to 770-805-3918, Attn: B. Lyon, or send to Vanstar Corporation, 100 Hamilton Park Dr., Roswell, GA 30076. Please visit our web page at www.Vanstar.com

Vanstar
An Automotive Business Solutions Company

Windows NT Professionals

Our rapid growth can lead to yours

Alternative Resources Corporation® is a premier provider of technical resource and consulting services to information technology departments of major corporations nationwide. We're one of America's 100 fastest-growing public companies, with offices in 47 major cities.

Because of our explosive growth, ARC can provide challenging opportunities for talented technical professionals with the skill sets our clients demand. We are currently seeking experienced Windows NT professionals for a broad range of opportunities.

Besides career growth opportunities and excellent compensation, ARC's technical employees enjoy an outstanding selection of benefits including:

- Comprehensive training and career development programs
- Authorized vendor certification programs, including Windows NT
- Liberal bonuses and incentives for continuing education
- Stock and stock purchase plans
- 401(k) plan
- Health insurance

If you're interested in growing your career portfolio with a leading edge company, we invite you to forward your resume. Please include your skill competencies and indicate whether you are available for travel in the U.S.

RESOURCES

Attn: NT
75 TH-State International, Suite 100
Lincolnshire, IL 60069, Fax: (847) 317-1008

To find out more about ARC and the opportunities in your area, visit our web site at http://www.arc.com.

Programmer Analyst, Senior. Optimize & fine-tune SQL query programs used for inventory control & forecast'g to run on near real-time; setup, configure, & tune Sybase & Oracle database management systems, & underlying Unix platforms; perform sequential analysis, design, programm'g, & quality assurance test'g using utilities in Unix environment; guide team of Programmer Analysts in test'g & trblshoot'g problems to plan'g & logistic system, train junior Programmer Analysts as use of Unix operat'g systems, C programm'g tongue, & SQL programs, apply knowledge of network architecture & communicat'n protocols to design, implement & enhance a global client/server plann'g & logistic database mangmnt system. Grad student, grad reach, or work exp must have provided hands-on exp in follow'g: DBMS theory, design & optimizat'n, SQL queries optimizat'n, allows specificat'n, design, implementat'n & quality assurance; Unix operat'g systems, at least 6 months exp. in test'g or teach'g in the computer field; & network architecture & communicat'n protocols. Min 40/wk, $5,210/mo, job site & where Santa Clara, California. Qual applicants send res to: ADKE8666DZ, PO Box 50119, IMS SC4-117, Sta Clara, CA 95052-8119. Pkf of auth to wrk in US req if hired. Company is an Equal Opportunity Employer & fully supports affirmative action practices.

JOBS!

DICE is looking for Data Processing, Engineering and Technical Writing professionals to fill open positions for companies nationwide

DICE is a FREE online job search service, providing detailed information about current contract and fulltime positions across the USA. Please contact by calling ANY of these access numbers, using your computer & 1200-9600 baud Modem, 8-N-1.

California	408-737-9339
Georgia	404-523-1341
Illinois	708-782-0960
Iowa	515-280-3423
Massachusetts	617-266-1080
New Jersey	201-242-4166
Texas	214-691-3420
Internet	telnet dice.com
Web	www.dice.com

DATA PROCESSING INDEPENDENT CONSULTANT'S EXCHANGE

A Service of Dial Online, Inc. (515) 280-1144

LEAD YOUR CAREER INTO THE NEXT MILLENNIUM

Sterling Commerce, the global leader in Electronic Commerce products and services, invites you to join ***a dynamic team that impacts the way the world does business.*** The Interchange Software Group has the following positions available:

- Implementation Consultants
- Software Developers & Software Analysts (NT, UNIX, AS/400)
- Software & Communications Product Support Specialists
- Product Managers/Specialists
- Market Managers/Specialists
- International Consultants
- Software Licensing Specialist
- PC Support Analyst
- Lotus Notes Administrator

For immediate and confidential consideration, please send, fax or E-mail cover letter and resume indicating position preference and salary requirements to: **STERLING COMMERCE, Dept. ISG-CW, 4600 Lakehurst Court, Dublin, OH 43016. Fax: (614) 793-5150 or E-mail to: employment_isg@stercomm.com.** Sterling Commerce maintains a non-smoking work environment and is an Equal Opportunity Employer M/F/D/V

Investigating the Sterling Commerce success story costs nothing. Check out our Home Page at:
http://www.sterling.gentran.com
We could be the solution to your next career move!

STERLING COMMERCE

Loyola University New Orleans

Loyola University New Orleans seeks applicants who possess strong planning, organizational and communication skills and who have a record of successfully progressive managerial experience in information management preferably in a higher education technology environment. The Assistant Provost for Information Technology reports to the Provost and Vice President for Academic Affairs and will provide leadership for all aspects of information technology including academic and administrative computing, network services, user support, telecommunications and the computer center. The Assistant Provost will be responsible for budget, personnel, strategic planning and policy development as they relate to information technology. The Assistant Provost will be expected to provide unified direction for the use of technology within the university strategic plan. The Assistant Provost will likewise be expected to provide direction for the effective and efficient application of information technology to education and administration.

The successful applicant must possess excellent interpersonal skills and a commitment to participatory management and team building. Significant experience in integrating information systems, resources, and service in support of academic and administrative functions is required. A record of leadership and management effectiveness, current knowledge of educational technologies, including distributed computing, networking systems, distance learning and software applications will be expected of the successful applicant. A masters degree or an equivalent combination of education and experience is required.

Loyola University New Orleans is located in the historic uptown section of New Orleans. Founded by the Jesuits in 1912, the university is organized around five colleges and schools: the College of Arts and Sciences, the College of Business Administration, the College of Music, City College and the School of Law. The university offers more than 60 fields of study at the baccalaureate and masters levels, and through its School of Law, it offers the Juris Doctor degree. The fall 1995 enrollment was over 5,600 students. The university employs approximately 900 persons including 260 full-time faculty and operates on a budget of 72 million dollars supported in part by an endowment of 220 million dollars.

This position offers a competitive salary as well as an excellent fringe benefit package. Please submit current resume, statement of interest and the names, telephone numbers, and addresses of at least three professional references. Applications and nominations will be considered until the position is filled; however applicants are encouraged to submit applications by October 4 1996 for full consideration. Applications, nominations and inquiries should be addressed to:

Dean J. Patrick O'Brien
c/o Office of the Provost
Loyola University
6363 St. Charles Avenue
Campus Box 7
New Orleans, Louisiana 70118

LOYOLA UNIVERSITY NEW ORLEANS

Loyola University is an equal opportunity, affirmative action employer.

SENIOR ORACLE DEVELOPERS

Lockheed Martin Services, Inc. is a worldwide leader in providing technical services for the Government and leading businesses. Discover the challenge, opportunity and rewards of working in a leading-edge team environment in greater Cincinnati.

Candidates should be very knowledgeable in all aspects of Information Systems with demonstrated communication skills, both oral and written, for direct client contact. Experience and proficiency in development and effective maintenance/enhancement support in an UNIX, ORACLE, Motif environment. You will perform comprehensive analyses and studies as well as develop/maintain application software for enhancements and new system functionality.

To qualify, 4-8 years of progressive experience in the field of information technology, including 4 years of specialized experience in ORACLE application design, development, installation and support. Hands on experience with ORACLE database 7.x, ORACLE ProC, C programming, and X-Windows/Motif.

If you are interested in a challenging position on a high performance team, send your resume and salary history to: Lockheed Martin Services, 5203 Leesburg Pike, Suite 1500 (Dept. VA24), Falls Church, VA 22041. Fax: 703-845-0127. An Equal Opportunity Employer.

LOCKHEED MARTIN
Mission Success

Project Engineer assigned as Project Manager to plan, coordinate & direct software development & design projects for complex computer systems running on AS/400, including production of time estimates & maintenance of schedules; coordination with users, other personnel & vendors; assignment of duties to staff; oversight of software design & resolution of design problems; coordination of system documentation; provision of quality assurance & compliance with user needs, computer capabilities & company guidelines; & coordination of installation & implementation, utilizing data queues, data areas & subsystems, subfiles, system performance monitoring & RPG & CL. Multiple openings available. Requires B.S. or equivalent degree in Electrical, Civil, Mechanical or other math based engineering discipline, one yr. experience in Project Mgmt. & three yrs. experience in software design, development & maintenance in RPG & CL coding on AS/400 system; & thorough proficiency to data queues, data areas & subsystems, subfiles, system performance monitoring, project mgmt, software design, development & maintenance to RPG & CL coding on AS/400. Must be primarily eligible for permanent employment in U.S.A. Salary $48,000-70,000/yr depending on qualifications plus Benefit Plan; 40hr/wk (8am to 5pm), overtime as needed without additional compensation. Send resume & details of experience to Mrs. J Geerts, Job No. 413139, Division of Employment Security, P.O. Box 332, Florissant, MO 63032. An employer paid ad.

System Engineer, Network Systems: Directs and manages various network communication equipment for purposes of allowing data transmission and communication systems in a LAN/WAN network environment. Directs the configuration of such network communication systems including configurations of routers, hubs, and bridges which are installed in a multi-platform environment. Insures that such network systems are contained with the appropriate cable design to allow both voice data and video transmission within customized cables. Establishes network systems to comply with standards as established by CCITT, ANSI, and IEEE as they relate to such communication equipment. Determines cost estimates and project personnel resources to be allocated to the development stages of such network systems. Determines appropriate hardware configuration including implementation and support of Cisco, 3Com, and Bay network routers by determining appropriate structured cabling designs and wiring. Requires Master's degree in Computer Science or Computer Information Systems or MBA degree with specialization in Computer Information Systems. Also requires three years experience in the job to be performed. Must be a Certified Network Engineer. Hours: 8:00 a.m. - 5:00 p.m. 40 hours per week at $6,000.00 per month salary. Must have proof of legal authority to work permanently in the United States. Please send resume to: Beth Woodhouse, System Manager, IPC Information Systems, Inc., 100 South Wacker Drive, Suite 1500, Chicago, Illinois 60606 No Calls.

Professional Opportunities in Beautiful Downtown Hazard

Wilson N. Jones Regional Health System is a 261-bed acute care hospital, located one hour north of Dallas in the friendly city of Sherman near Lake Texoma. Our healthcare professionals are committed to providing our safe, comfortable community with the diverse medical services and quality care it needs. If you desire a professional challenge in a peaceful country setting, consider Wilson N. Jones home.

System Programmer

We are currently seeking a System Programmer to develop, implement and maintain program and database applications to support varying departmental data requirements. You will also be responsible for analyzing and modifying current hospital information system applications to meet clinical and financial departmental needs. This position requires a Bachelor's of science degree in Computer Science with a minimum of 3 years applicable programming experience. Must be knowledgeable of software design techniques to include data flow diagramming, database schema, and documentation. Strong knowledge of PC software development, network software development and implementation.

Wilson N. Jones Regional Health System offers a competitive salary and a comprehensive benefits package. Please apply in person or fax resumes to: Wilson N. Jones Regional Health System, 500 N. Highland, Sherman, TX 75092. Fax (903) 870-4578. Job line (903) 870-4514 (24 hours). EOE/M/F/ADA

WILSON N. JONES REGIONAL HEALTH SYSTEM
Health Solutions For A Lifetime

© 1996 Wilson N. Jones Regional Health System

ORACLE/IRI EXPRESS
ORACLE SALES ANALYZER
ORACLE/IRI FINANCIAL ANALYZER

International Company in Miami, Florida area developing a Strategic Information Warehouse System seeks experienced EIS/DSS Developers. TOP $$$$ FULL RELO For information about this and other Permanent Florida opportunities contact:

ROBERT HALF
Information Systems Recruiting
200 E. Las Olas Blvd. Suite 1650
(954) 761-3811 or Fax. (954) 763-9346
E-mail HALFPERM@AOL.COM
ATTENTION: Ronna Zee

ROBERT HALF.
Information Systems Recruiting™

© 1996 Robert Half. An Equal Opportunity Employer

Programmer/Analyst · Analyze user requirements and system capabilities in the design, coding, testing, and modification of all in-house software, such as SQL* Plus, PL*SQL, Oracle*Report, SQR, Oracle Forms 2.3 and 3.0, C++Programs, UNIX and DOS Shell Scripts. Install new software and peripheral devices. 40 hrs. 8:30am - 5:00pm. $33,200/year. Req. B.S. (Computer Science), 1 year exp. Must have proof of legal authority to work permanently in the U.S. Roselle, IL. Send resumes: Illinois Department of Employment Security, 401 S. State St. - 3 South, Chicago, IL 60605. Attn: Brenda Kelly. Ref # V-IL 13957-K. An Employer Paid Ad. No Calls. Send 2 Copies of Both Resume & Cover Letter.

Programmer/Analyst (Dallas/Ft. Worth metro TX) Performance of NATURAL II/ADABAS structured & reporting mode financial & administrative programming & software design on IBM mainframe utilizing COBOL with JCL & TSO. Requires 2 yrs. exp. in job offered. $40,000/yr., M-F 9-5, 40 hrs./wk. Please send resume describing qualifications to: Jennifer Wease, Human Resources Dept., Cutler Williams, Inc., DBA Comsys, 4000 McEwen So., Dallas, TX 75244

Computer/Info Systems

SENIOR ANALYST

Wilson Salary Harper College is seeking an experienced Senior Analyst to assume leadership of our financial systems in UNIX Client/Server environment. The scope includes A/P, G/L, Budget, Purchasing and Capital Asset Management.

Successful candidate must have a BS degree, a minimum of 5 years large scale system development and implementation experience, 2-3 years project management experience and strong technical, analytical and interpersonal skills. Experience with Relational DB and 4GL is required. UNIX and Client/Server experience preferred. Experience with financial system software is desirable. Broad familiarity with advances in the field of Information Technology is a must.

We offer a challenging and dynamic environment, teamwork, and state-of-the art technology. To apply, send a letter of interest, salary history and resume to:

Employment Specialist-BA
HARPER COLLEGE
1200 W. Algonquin Rd.
Palatine, IL 60067.

Harper College is an Equal Opportunity Employer which encourages applications from women, ethnic minorities and persons with disabilities.

Systems Analyst · Analyze user requirements, procedures & problems to automate process or to improve existing comp. sys.; confer with personnel of organizational units involved to analyze current operational procedures, identify problems & learn specific input & output requirements such as forms of data input, how data is to be summarized & formats for reports; write detailed description of user needs, program functions & steps required to develop or modify comp. program; review comp. sys. capabilities, workflow & scheduling limitations to determining if requested program or program change is possible within existing sys.; prepare workflow charts & diagrams to specify in detail operations to be performed by equipment & coding programs & operations to be performed by personnel in sys. upgrade sys. & correct errors to maintain sys. after implementation sys. design, development, implementation, documentation & using AS/400, OS/400, RPG/400, Windows, C & PC network. Reqs. Bachelor's in Comp. Science, Sys. Analysis, Comp. Information Sys., Comp. Engineering, Electrical Engineering, Electronic Engineering, Mathematics or its equivalent to ed. & exp. & 2 yrs. exp. in job offered or 2 yrs. exp. in related occup. as a Programmer Programmer Analyst, Systems Analyst, S/W Engineer Consultant or Systems Programmer. Will accept 3 yrs. of college ed. plus 3 yrs. exp. in the job offered or in a related occup. in lieu of the required ed. & exp. & max. of the exp. in the job offered or related occupation must include sys. design, development, implementation, documentation & using each of the following: AS/400, OS/400, RPG/400, Windows, C & PC network. $45,000/yr., 40 hrs./wk, 8:30a-5:15p, M-F. Send resumes to 7310 Woodward Ave., Rm. 415, Detroit, MI 48202 with Ref. #115196. Employer Paid Ad.

Programmer Analyst to analyze user business requirements; program test & document applications to specifications; use operating systems, tools & knowledge of programming for developing database, graphic utilities & online data acquisition; implement & maintain upgrades/modification of programs; application support; evaluate software testing tools & techniques; testing methodology which involves software design validation & verification using C, FORTRAN & Oracle; Reqs. Bach. in Comp. Sci, Comp. Engg, Information Systems or equiv. ed & exp. 2 yrs exp in job offered or 2 yrs exp as Programmer Analyst, Programmer, Project Leader or Scientific Officer. Related exp must include computer programming, writing & developing databases online data acquisition, developing graphics utilities, maintaining & improving software programs. Must have exp or training using C, FORTRAN & Oracle. $42,940/yr 40 hrs/wk 8a-4:30p. Send resume to 7310 Woodward Ave., Room 415, Detroit, MI 48202. Ref. #118496 "Employer Paid Ad"

Database Analyst: Designs, develops and modifies insurance informational databases installed in MS Access environment and on a Windows NT or Windows 95 platform, including designing of graphic user interfaces using Visual Basic and Visual C++ for purposes of customizing databases to retrieve data and mathematical formulas for use in insurance industry. Insures that data is capable of customizing reports, charts, and graphs to illustrate various insurance products and insurance transactional systems (including contract management information databases and integrated scheduling databases) for presentation before customers by implementing the 32bit processing capabilities of Windows 95 and Windows NT platforms in conjunction with Access's 32bit processing database system. Insures that all databases are capable of being accessed in field presentations through use of networking systems and client/server environments and modifies such databases to allow flexibility of installation of additional customized data modules. Requires Master's Degree or completion of coursework for Master's Degree in Computer Science or Mathematics. Also requires six months experience in the job offered, or six months experience as a System Analyst. If experience is related field, entire experience must include the design and development of transactional database management system using Visual Basic for graphic user interfaces in an Access 32 bit processing database. Education to include completion of one project to Development and implementation of a networked client/server using Visual Basic in a Windows NT platform. Hours: 9:00 a.m. - 5:00 p.m., 40 hours per week at $40,700 per year salary. Must have proof of legal authority to work permanently in the U.S. Please send resume to: Chuck Zachow, Manager, Administration, FIPSCO Inc., 1090 Executive Way, Des Plaines, IL 60018. No calls.

Computing Success.

- CICS, DB2, IMS
- AS400, RPG
- COBOL, COBOL II
- SAP, ABAP
- Visual Basic, Access, PowerBuilder
- Unix, C, C++
- Visual C++, MFC
- Oracle

Bradford & Galt has become one of the top MIS consulting firms in the Midwest for one reason: We are totally dedicated to our staff. We are selective in their hiring, sensitive in their placing and committed to both their short-term job satisfaction and long-term career development. If our formula for success tracks with yours and you have at least two years working experience in one of the areas listed, please send your resume to us today. Opportunities in St. Louis, Kansas City and Chicago.

EOE

Bradford & Galt
CONSULTING SERVICES

Lisa Adams
12400 Olive Boulevard
Suite 430
St. Louis, MO 63141
(314) 434-9200
Fax: (314) 434-9266
lisa@bgcs.com

"Mayberry, Madison ...same difference."

LAN TECHNICAL SUPPORT WINDOWS NT

MULTIPLE OPENINGS

TDS/CS has information systems opportunities in Madison, Wisconsin — a city that has been honored by Money Magazine as this year's Best Place to Live. Surrounded by lakes, this friendly community is comparable to the fictional "Mayberry," offering a vibrant economy, excellent schools, low crime, superb health care and a range of cultural activities.

At TDS/CS, we need LAN professionals who can provide direct support in the development, installation, testing, and maintenance of Microsoft Windows NT Operating Systems and Windows-based applications. Chosen associates will provide Level 2 assistance to our existing Help Desk Operations. Windows NT support and/or implementation experience required. Some positions require advanced knowledge of NT with a strong background in SMS and RAS.

Enjoy all the advantages of a make-believe "Mayberry" in real Madison, Wisconsin. In addition to a complete salary and benefits package, TDS Computing Services offers a continuous learning environment. To be considered for a career with TDS/CS, please send your resume and cover letter specifying salary requirements to: TDS Computing Services, Attn: NT, 8401 Greenway Blvd., Ste. 300, Middleton, WI 53562. Confidential 24 hr. Fax: (608) 828-6568. e-mail: careers@tdsits.com Learn more about TDS/CS by visiting our Home Page at http://www.tdsits.com or by calling our Job Line at (608) 233-3260-Option #8. EOE

TDS CS
TDS COMPUTING SERVICES

TDS TELECOM

AMERICAN PAGING

UNITED STATES CELLULAR
MOBILE TELEPHONE NETWORK

Fleming Companies, Inc.

Fleming Companies, Inc., a Fortune 100 company, has the opening in our Information Services department at the Oklahoma City staff.

Systems Programmer

Requirements include 2+ years programming experience and proficiency in COBOL, CICS, VSAM, and MVS/JCL or VSE/ESA/JCL. Familiarity with one or more of the following a plus: CSP, DB2, SQL, and ISPF. Knowledge of wholesale/retail food industry a plus.

Oracle DBA

Requirements include 2+ yrs experience in Oracle 6+ environment, logical/physical design and implementation standards. Experience with DB2/MVS, Unix computer applications, development tools.

Fleming offers competitive salary and benefits package. Qualified candidates should send resume specifying position and salary history to: Fleming Companies, Inc., Associate Support, P.O. Box 26647 Oklahoma City, OK 73126.

Equal Opportunity Employer M/F/V/D

Visit our web site www.lonet.net/~fleming/

Software Engineer: Design, develop, and modify data communication or voice communication software systems for PC-based multi-function ISDN terminals using Telesoft software. Uses HP Logic Analyzer and various emulators and protocol testers to insure integrity of product and accuracy of data transfer and acquisition. Implements communications software using V.120, V.110 and PPP communications protocols (both 64K and 56K). Requires Master's degree in Electrical Engineering. Also requires two years experience in the job or be performed. Education to include completion of one project to the development of an PC based voice multi-tasking voice processing system using C++ and voice compression algorithms for telephone interface purposes. Hours: 8:30 a.m. - 5:00 p.m. 37.5 hours per week at $53,000 per year salary. Must have proof of legal authority to work permanently in the United States. Please send resume to: Larry Alaria, Human Resources, U.S. Robotics, 8100 North McCormick Boulevard, Skokie, Illinois 60076-2999. No Calls.

Systems Analyst and Sr. Systems Analyst Positions, Dayton OH: lead responsibility for develop. of major business systems. Analysis & design of business related software systems and functional development of functional requirements, documentation, testing and training. Requires B.S. math, computer science, IT, or software engineering and 2 yrs exp. as systems analyst and in business software development. Experience to include at least one yr in develop. of new systems. Technically competent in multiple computer languages, including Unix; expertise and working knowledge of 4GL. $36,000 to $66,236 per annum depend. on experience. Apply to: HR Mangr. PO Box 2237, Dayton, OH 45401-2237. EOE M/F/D/V.

With over two decades of information systems experience, Triple-I has become a premier IT consulting firm. Our background, combined with a network of over 2000 technical professionals has enabled us to become an industry leader at the local, regional, and national level.

As a Triple-I Systems Engineer or Architect you'll encounter a wide range of products, systems, and industries. And you'll be given every opportunity to expand your knowledge and grow professionally. If you want to join a company committed to excellence and client satisfaction, please call or send your resume to:

III of Colorado, Inc.
5445 DTC Parkway, PH-I
Englewood, CO 80111
(303) 721-9900
fax (303) 721-9947
Attn: Robin Baker

Triple-I Corp.
6330 Lamar Ste. 220
Overland Park, KS 66202
(800) 444-8181 ext. 2041
fax (913) 262-4284
tlaupa@triplei.com

WINDOWS NT & LOTUS NOTES

CRC, an international IT firm headquartered in NYC, has career openings in our Windows NT & Lotus Notes Practices. We'll rely on you to rollout enterprise-wide NT v4.0 & Notes v4.x & support multi-server global networks. You must have 2+ years hands-on experience with either NT 3.51 or Notes 3.3 in a large financial environment. BS in Comp Science preferred. Positions offer superior compensation & benefits pkg, training & advancement.

E-Mail Careers @email.crcnyc.com;
Fax (212) 908-8887; call Ms. Ovalle (800) 333-3272.

CRC COMPUTER RESOURCE CORPORATION
575 Lexington Avenue
New York, NY 10022

http://careers.computerworld.com

Careers

Apertus Technologies Incorporated is an international, multi-product software company with solutions that enable organizations to integrate diverse applications, data and networks seamlessly and cost-effectively. Apertus -helps companies preserve their investment in maturing legacy systems while enabling them to integrate the efficiencies of newer, open architectures and opportunities, including the World Wide Web.

APERTUS

With annual sales of $55 million, Apertus is an industry leader that provides innovative, middleware integration and enterprise-wide management solutions. Apertus' customer base includes Fortune 1000 corporations, major domestic telephone providers and interchange companies as well as several indirect channels. The 69th largest software company in the world (Software Magazine, July 1996). Apertus is traded on the NASDAQ under the ticker symbol APTS.

Apertus offers a unique range of data communications solutions to Fortune 1000 customers worldwide. Be sure to check out our home page on the Internet at http://www.apertus.com. Currently, we are looking for the following skills at our Corporate Headquarters in Eden Prairie, Minnesota:

- Software Engineer - position requires C++, Windows NT and OO analysis and design
- Application Support Engineer - position requires UNIX admin. skills and a background in Project Support.
- Professional Services Consultant - position requires C programming, in a UNIX environment.
- Software Engineer - position requires Client Server development and 4-6 years of C/C++ programming under UNIX.

Apertus offers excellent salary and benefits. Please send your resume to Apertus Technologies Incorporated, 7275 Flying Cloud Drive, Eden Prairie, MN 55344, or e-mail to at kari.enslin@apertus.com

Systems Analyst: Creates, develops, and modifies computer database systems which are installed in a midrange computer workstation environment. Develops various multi-tiered client-server applications using Powerbuilder or Forte as a front end, C++ as a programming language, and either Sybase or Oracle as a backend relational database. Develops various distributed client-server applications using object-oriented technology methods, including Booch and Rumbaugh analysis, and testing of the robustness and integrity of distributed system object models for purposes of data distribution. Requires Master's degree in Management Information Systems or Computer and Information Science. Also requires two years experience in the job to be performed. In lieu of two years experience in the job to be performed, will accept a combination of two years experience in any of the following job titles: Software Engineer, Programmer, or Programmer Analyst, if at least one year experience includes the performance of the duties in the job offered. If the second year includes use of object oriented technology in a midrange computer platform to design and develop distributed relational databases. Hours: 9:00 a.m. - 5:00 p.m. 40 hours per week for $58,000.00 per year salary. Must have proof of legal authority to work permanently in the United States. Please send resume to: Karen T. Riedel, Human Resources Manager, Baxter Healthcare Corporation, 1620 Waukegan Road, MPR-AIN, McGaw Park, Illinois 60085. No Calls.

SOFTWARE ENGINEER

A growing manufacturer of polyurethane specialty products seeks a Software Engineer to join our MIS Department.

Reporting to the MIS Manager, this individual will support and train staff on all necessary software, perform network administration duties, and manage hardware installation, repair and preventative maintenance. Ideal candidate will possess a four-year MIS degree, working knowledge of Lotus Suite, Novell Administration, and some knowledge of BASIC, CNE, and/or UNIX experience a plus.

We offer challenge and a competitive compensation and benefits package including vacation and 401(k) plan. Forward resume and salary history to:

FLEXIBLE PRODUCTS COMPANY
Insta-Foam Products Division
1500 Cedarwood Dr.
Joliet, IL 60435
Attn: J. Bertino
Fax: 815-741-6824
EOE M/F/D/V

Systems Analyst: Implements and test accuracy of data information transferred for use in a multimedia telephone billing system. Ensures that system information allows flexibility of analyzing and modifying calling time and billing rate data including investigation of such modules as is necessary to modify parameters used to establish accuracy of billing records. Established informational graphic user interfaces and modifies database which are installed in a networked HP 9000 operating system. Uses Visual C++ and or Powerbuilder to establish appropriate backend functions which are capable of being administered in a networked environment including use of algorithms for file compression purposes. Requires Master's Degree in Computer and Information Sciences or Management Information Systems. Education to include completion of one project in: Development of relational database informational management system using SQL. Implementation of a file compression program using algorithms. Building of an SQL Server to create profiles of data files. Administration and Maintenance of a network using either an HP9000 or a Sun Solaris operating system. Hours: 9:00 a.m. - 5:00 p.m., 40 hours per week to $42,500 per year salary. Must have proof of legal authority to work permanently in the U.S. Please send resume to Linda S. Korte, Human Resources Manager, Genesis International, Inc., 2401 West Hassell Road, Suite 1580, Hoffman Estates, IL 60195. No calls.

Programmer & Analyst (Chicago, IL) Design/program/develop software for use in electronic BBS, design/program/develop automated data formatting & transmitting software for comm'l Home Page relating to WWW site; administer online & WebServer working w/Mktg & Communication Staff; use FoxPro, CommTools in conjunction with TBBS, TDBS & C/C++, UNIX Shell scripts to dvlp client/server systems on multi-platform incl DOS, Windows-NT, & UNIX; write cgi-bin scripts in UNIX Korn Shell; integrate database functionality & as in other Internet Web capabilities to Web Server applics. Reqd: min BS-comp sci & MBA. Academic background must incl academic rearch in Cross-Platform System Prgm, using FoxPro database prgming & CommTools Communications Library in conjunction with TBBS System & TDBS prging lang to dvlp s/ware. Education must incl completion of 1 course in each of the following: Database Prgmng; Data Structures; Unix OS; Billing Theory & Practices, & Economic Theory. Must have proof of legal auth to work permanently in US. 40 hrs/wk, 8a-5p; $39,200/yr. Send 2 copies of both resume & cover letter to: IL Dept. of Employment Security, 401 S. State S-3 South, Chicago, IL 60605. Attn: Marty Miles, Ref: V-IL 14798-M. An employer paid ad. No calls.

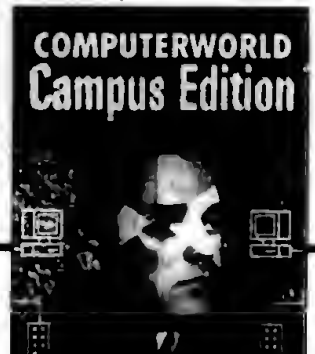
OBJECT DEVELOPER: Design, develop, test, manage, support and maintain various software development projects for the Company. Specifically work on the design and implementation of the Order Administration System using Object-Oriented methodology. Develop new software applications based on requirements (using software such as Power Builder 4.0, Sybase System 11, MS-SQL Server, Rogue Tools, C++, Replication server in DOS, UNIX, Windows 3.1, Windows 95 and Windows NT operating systems). Support and maintenance of the Order Administration application which is in production. Design of new products using object oriented methodology (such as Power Builder 4.0, Sybase System 11, MS-SQL Rogue Tools, C++, Replication Server). Writing process specifications for new projects for the development team. Must have B.S.C.S and 3 years of experience in software design and development. All experience may be gained concurrently. 40 hrs/wk (8-5); $60,000/yr. Send resume to: Oklahoma State Employment Service Office, 110 S. Hartford, Suite 108, Tulsa, OK 74120 (ID# 7207) re: Job Order #238689. EOE

Consultant to consult with clients & define their business requirements & provide solutions: analyze, design, develop & debug applications in client/server environment; system integration; assembly application specifications that are to be automated; design data requirements, use Oracle 7.0/7.1/4 to develop application development tools; use SQL*Forms 3.0/4.0 in generate screens/forms; migrate & convert application screen/forms from SQL*Forms 3.1/4 to 4.0; use Oracle to develop on-line & batch reports; import data base mainframe system to the system using Pro*C & SQL*Loader; develop & maintain generic data base procedures & triggers using SQL*Plus & PL/SQL; code & maintain C user exits; maintain Unix system V release 3.2; use TKPROF for optimization of system resources & performance; Reqs. Master's in Comp. Sci. or Comp. Engg., 2 yrs exp in job offered or 2 yrs related exp such as Programmer Analyst, Systems Analyst, Software Engineer. Must have some related exp analyzing, designing & developing systems, systems integration, optimizing system performance & resources & using Oracle 7.0 or 7.1/4, PL/SQL 1.1/2.0, FORMS 3.0/4.0, Oracle Reports 1.1/2.0, SQL*Loader, Pro*C, RPC, TCP/IP & UNIX. $58,572/yr, 40 hrs/wk, 8a-5p. Send resume to 7310 Woodward Ave., Room 415, Detroit, MI 48202. Ref #125396 "Employer Paid Ad"

COMPUTERWORLD 9th Annual Campus Edition

Recruit top I.T. students from top I.T. Campuses!

Issue Date: Oct. 31, 1996



Plan Now!
1-800-343-6474, x8201

ATTEND

Computerworld's Bay Area Corporate Technical Recruiting Conference!

Monday, November 4, 1996

Hotel Nikko, San Francisco, California

On November 4, 1996, you have a special opportunity to update your recruiting skills and network with recruiters in your area at the first-ever San Francisco area Corporate Technical Recruiting Conference, held at the Hotel Nikko, San Francisco, California.

A Full Schedule of Contemporary Topics

7:30am **Continental Breakfast & Conference Registration**

Concurrent Sessions:

Candidate Selection: How to Pick the Right People
Dr. Wilson Sons, President, Sons Consulting

The Critical Importance of Soft Skills and the "Invisible Assembly Line"
Todd Schenck, Priority Management Systems, Inc.

Immigration Issues
David P. Barry, Esquire, Barry & Appleton

Proactive Recruitment Techniques
Dave Drugman, President, Bay Cities Research, Inc.

12:15pm **Luncheon Keynote: Industry Trends**
Maryfran Johnson, Executive Editor, Computerworld

Repeat of Concurrent Sessions

Town Hall Forum
John Younger, President, y-not

6:00p.m **Program ends**

Selected sessions include:

Proactive Recruitment Techniques
Dave Drugman, President, Bay Cities Research, Inc.
To remain competitive, today's technical recruiters need to be aware of the latest trends in sourcing and proactive recruiting. This in-depth session from a leading expert will explore this critical topic and will help you put your resources and expectations into proper perspective.

Industry Trends
Luncheon/Keynote Address
Maryfran Johnson, Executive Editor, Computerworld
Sure, there are new skills entering the market every day, but what are the trends that drive these skills? Maryfran Johnson, one of the industry's leading watchers of the Information Systems profession will give you an up-to-the-minute view in this very special keynote address.

Town Hall Forum
In this session, you'll not only be able to propose your specific questions for open discussion, you'll learn of real world issues and solutions from your peers. You won't want to miss this rare opportunity as John Younger, an expert in the HR field, leads us through this modern discussion of your recruiting topics.

For more information, call the conference hotline:
1-800-488-9204

Exciting Opportunities in Orlando!

- CONSULTANT PC SOFTWARE ENGINEERS
- PC SOFTWARE ENGINEERS
- ASIC DESIGN ENGINEERS
- SOFTWARE PRODUCTS ENGINEERS
- ASIC DESIGN TOOLS SUPPORT ENGINEERS

Isn't 'serious fun' a contradiction in terms? Not at REAL 3D. While we're very serious about leading in any endeavor, we're having all kinds of fun doing it. For us, exploring new applications for use of our patented, real-time visual simulation technology has already paid off in arcade, PC and other commercial ventures. Plus, we've taken our computer products and service know-how to the commercial business world with phenomenal success. And, as we see it, we've only scratched the surface.

We're a company infused with new energy, new focus, and new visions of what the future holds. We're market-driven, quick to move, and discovering unlimited potential for what we offer. It's exciting, inspiring, and according to the technical professionals on our team, the kind of fun you can only have at the leading edge.

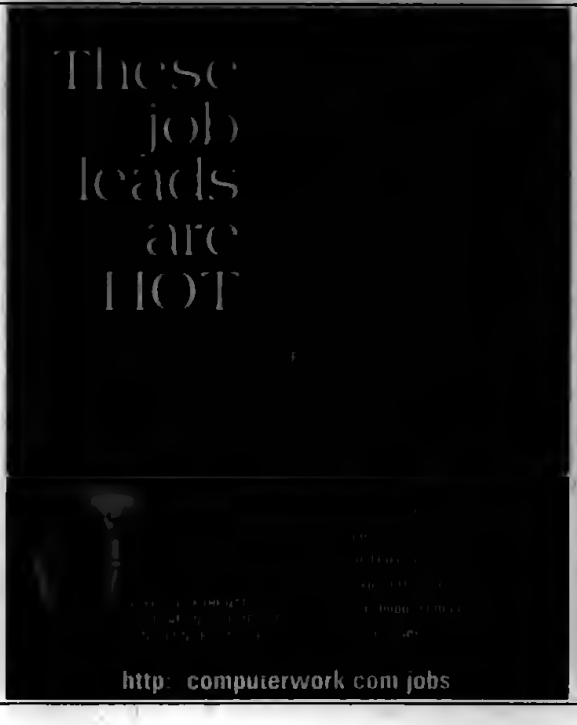
If you're up for some serious fun, have a BSCS/BSEE degree and experience in one or more of the following areas, consider joining us!

- **Windows NT/Windows 95 driver development, including GDI Display Drivers**
- **Knowledge of Direct3D, DirectDraw and OpenGL APIs**
- **Video/System BIOS development**
- **C++ skills with knowledge of third party commercially available software toolkits**
- **Designing graphics ASICs using top-down hardware design language (HDL)/ synthesis/analysis/verification**
- **Designing high-speed digital circuits:**
- **Supporting ASIC development with CAD/CAE tools (e.g. Verilog, VHDL, Synopsys, IKOS, MOTIVE and SUNRISE)**
- **ASIC physical design sizing, floor planning, and place-and-route**

As a member of our team, you will be involved with the development of PC device driver software for new 2D/3D PC graphics products; ASIC developments for new PC graphic products, or the life cycle development of interactive software products and high-speed digital ASIC designs for computer graphics products. Plus, you'll enjoy a competitive salary and excellent benefits package.

If interested, please forward, fax or e-mail your resume to **Human Resources Dept., REAL 3D, 12506 Lake Underhill Rd., MP811, Orlando, FL 32825-5002. FAX: 407/306-5641, e-mail: Real3D@real3D.com** Equal Opportunity Employer.

LOCKHEED MARTIN



THE LEADING EDGE OF

TECHNOLOGY

Leading the world into the future

At IBM, we're continually innovating, creating a future most can only imagine. If you want to see your efforts propel your career, apply them to the challenges at IBM. We can give you the advantages of working for an industry leader in an environment that embraces innovation. And we offer a level of responsibility that is challenging and offers you potential for continued achievement and career growth. Bring your expertise to the forefront — at IBM.

New and exciting growth opportunities exist at IBM today for a wide variety of professionals with WINDOWS NT SKILLS. These opportunities are expanding NOW in 2 of the most desirable locations in the U.S. - **Raleigh/Durham, NC and Kirkland, WA**, just outside Seattle, WA. Come join the industry leaders who are delivering Groupware solutions vehicles to the world!

NT DEVELOPMENT OPPORTUNITIES IN RALEIGH/DURHAM, NC & KIRKLAND, WA

Candidates for positions based in **Raleigh/Durham, NC** need to have C/C++ programming experience and skills in one or more of the following:

- Firmware Development
- Systems Management Utilities
- NT Kernel Mode Device Driver Development
- Operating System Customization/Optimization
- PC Server Systems Experience with an emphasis on OO Technology
- Hardware Abstraction Layer (HAL)
- Symmetric Multiprocessing (SMP)
- SDK, DDK, MFC Development
- X86 and PowerPC Platform Applications Development
- Knowledge of various server storage subsystems, communications, networking, clustering, telephony device driver designs and X86 Assembler is very desirable

Candidates for positions based in **Kirkland, WA** need to have C/C++ programming experience, plus skills in one or more of the following:

- Windows client/server applications development
- Strong network concepts and protocols such as TCP/IP
- Windows NT and/or Win95 device driver development/enhancement
- SQLServer performance tuning, DB2 performance tuning, SAP performance, certification and analysis, MS Win32 programming, MFC optimization compilers, Intel assembly level programming
- NT systems installation, setup and customer support
- Microsoft Systems Engineer, Product Specialists and/or Device Driver Development Certification
- Must have excellent communication skills, previous teaming and technical leadership experience, and possess the ability to work independently managing multiple tasks.

All Kirkland, WA positions require some travel.

To qualify for these openings, a BS or MS in Computer Science, Computer Engineering, Electrical Engineering or related field, or equivalent experience, is key.

The Raleigh/Durham, NC and Kirkland, WA areas offer excellent quality of life, affordable housing and many year-round activities.

In return for your skills and expertise we offer a competitive salary, comprehensive benefits package and an environment that rewards leadership. For prompt consideration, forward your resume, including **Job Ref. 9615BZ**on resume and all correspondence, to: **IBM Staffing Services, P.O. Box 12404, Raleigh, NC 27619-2404; FAX: 1-800-488-9840; e-mail: jobs@vnet.ibm.com.** Visit our website at **http://www.empl.ibm.com/carus.htm** for additional information on current positions. IBM is committed to creating a diverse environment and proud to be an equal opportunity employer.

IBM

Contract *Permanent*

LIFE INSURANCE

Nationwide Positions

!!! Top Rates !!!

- Life/70
- Vantage
- Cybertek
- LifeComm

All Mainframe Packages

The Firstech Corp

1-800-4-LIFE-70

fax: 619-789-8433

careers@firstech.com

Computer Jobs.

Lots of 'em

http www

Select

com

954 424 0563

ACQUISITIONS WANTED

We are looking for a computer consulting firm to acquire. Fast closing. Distressed firms are no problem. Will consider an equity investment or financing.

Contact: Laura Pansford

JANT TECHNICAL ASSOCIATES
Plaza of the Americas
600 N. Pearl, Ste. 370
Dallas, TX 75201

Ph (800) 777-2730 .Fax (800) 777-2714

computer

SAP R/3 CONSULTING OPPORTUNITIES

Careers for Experienced SAP Consultants *and* Consultants Seeking SAP Experience

SLI Consulting is an internationally recognized, worldwide provider of SAP R/3 consulting, training and system implementation services. Our success results from the consistently high quality of our work, the intense drive and initiative of our people, and our pragmatic, results-oriented implementation methodology (SLI-FOC™). In addition to our rapidly growing offices in Switzerland, we are expanding our North American operations based in Atlanta, where we are offering immediate employment opportunities for:

- **SAP FUNCTIONAL CONSULTANTS**
- **TEAM LEADERS**
- **PROJECT MANAGERS**
- **BASIS/ABAP/4 PROFESSIONALS**

We are looking for experienced consultants on all SAP modules to implement enterprise-wide systems at Fortune 500 companies and to conduct rapid implementations at mid-size clients. We also will provide superb training for consultants with limited or no SAP experience through our advanced training facilities in Switzerland. We offer competitive salaries, opportunity for advancement, and an outstanding work environment.

If you are team-oriented, dedicated, possess an entrepreneurial spirit, and want to succeed with a distinctive organization committed to the very best in SAP consulting, please send your resume to:

SLI CONSULTING

ENABLING THE ESSENTIAL

SLI CONSULTING INC.
Two Concourse Parkway Suite 810
Atlanta, GA 30328
Tel: (770) 730-8649
Fax: (770) 730-8656
E-mail: recruiting@sli-ag.com

R/3 IMPLEMENTER

SAP

SLI Consulting is an equal opportunity employer

PROGRAMMER ANALYST (2 openings): Plan, develop, test & document computer programs, applying knowledge of programming techniques & computer systems; evaluate user requests for new or modified programs to determine feasibility, cost & time req'd.; compatibility with current system & computer capabilities; consult with users to identify current operating procedures & clarify program objectives; formulate plan outlining steps req'd. to develop program using structured analysis & design; convert project specifications, using flowcharts & diagrams into sequence of detailed instructions & logical steps for coding into language processable by computer; apply knowledge of computer programming techniques & computer language, analysis, design, and coding of modules; development in client-server environment; analysis of business requirements by interviewing related users & modeling using entity relationship, function hierarchy & process model diagrams; creating standard template setting preferences for project & coding forms & reports.; & working on a variety of platforms to include DEC Alpha 4720, IBM Compatible PC, ORACLE 7, ORACLE*Forms, ORACLE*Report, ORACLE*Case, CASE*Dictionary & CASE*Generators (Designer 2000 & Developer 2000). Reqs: Bachelor's in Computer Science, Systems Analysis, Computer Information Systems, Computer Engineering, Electrical Engineering, Electronic Engineering, Mathematics or its equiv. in an & exp., 2 yrs. exp. in the job offered or 2 yrs. in a related occup. such as Programmer Analyst, Systems Analyst, Software Engineer or Consultant. Will accept 3 yrs. of college ed. plus 3 yrs. exp. in the job offered or in a related occup. in lieu of the req'd. an & exp. Must have some related exp. including analyzing, designing & developing systems & using each of the following: AS/400, OS/2, COBOL/400, PC Support & Communication Manager. $50,000/yr, 40 hrs/wk, 8a-5p. Send resumes to 7310 Woodward Ave., Rm 415, Detroit, MI 48202 & include Ref.# 125896. Employer Paid Ad.

PROGRAMMER ANALYST (2 openings): Plan, develop, test & document computer programs, applying knowledge of programming techniques & computer systems; evaluate user requests for new or modified programs to determine feasibility, cost & time required; compatibility with current system & computer capabilities; consult with users to identify current operating procedures & clarify program objectives; formulate plan outlining steps req'd. to develop program using structured analysis & design; convert project specifications, using flowcharts & diagrams into sequence of detailed instructions & logical steps for coding into language processable by computer; apply knowledge of computer programming techniques & computer language, analysis, design, development, testing, implementation & post implementation support for various business application systems; technical support & working on a variety of platforms to include PC LAN, AS/400, OS/2, COBOL/400, PC Support, Communication Manager, SDA, RLD, QUERY/400 & DOS/Windows. Reqs: Bachelor's in Computer Science, Systems Analysis, Computer Information Systems, Computer Engineering, Electrical Engineering, Mathematics or its equiv. in an & exp., 2 yrs. exp. in job offered or 2 yrs. exp. in related occup. such as Programmer, Programmer Analyst, Assistant System Analyst, System Analyst, Software Engineer or Consultant. Will accept 3 yrs. of college ed. plus 3 yrs. exp. in the job offered or in a related occup. in lieu of the req'd. an & exp. Must have some related exp. including analyzing, designing & developing systems & using each of the following: AS/400, OS/2, COBOL/400, PC Support & Communication Manager. $50,000/yr, 40 hrs/wk, 8a-5p. Send resumes to 7310 Woodward Ave., Rm 415, Detroit, MI 48202 & include Ref.# 125896. Employer Paid Ad.

Software Engineer-Dallas, TX to develop software for MS Windows using Visual C++ Design software system/modules using object oriented methodology 8am-5pm M-F 40 hrs/week $60,000/annum Require B.E. in Computer Science, Computer/Electrical Engineering or equivalent degree and 3 years experience must include software design, MS Windows based software development. Software development using Visual C++ and windows SDK and work with object oriented methodology Upto 100% employer paid travel within U.S. possible Apply at the Texas Workforce Commission 1117 Trinity, Room 424T, Austin, TX 78701 JO# TX 7904781 Ad paid by an equal opportunity employer

Senior Specialist Product Management sought by Telecommunications Company Duties: Oversee the development of a Network Switching Subsystem (NSS) component of a wireless telecommunication system. Monitor and direct NSS development to ensure NSS conforms to Global System for Mobile Communications (GSM) and ISO9000 telecommunication standards. Coordinate NSS development with other Senior Specialists overseeing the development of other digital telecommunication switching equipment. Set process deliverable requirements for NSS including software development. Develop new product introduction presentations. Manage monthly project reviews to establish development priorities and develop a project management plan to track developmental, operational, and verification support activities. Assess NSS product quality, project cost, customer satisfaction, and market impacts. Track departmental budgets and project financial status. Requirements: B.S. in Electrical Engineering and two years experience in the position offered or two years experience as a Project Engineer or Engineering Manager including two years of experience must include managing telecommunication product engineering process to ensure new products meet international regulatory requirements including ISO 9000 and conducting field of captive office verification testing of new products to ensure compliance with regulatory standards. M-F, 8:00-5:00, $45,000.00/year. Apply at the Texas Workforce Commission, Dallas, Texas, or send resume to 1117 Trinity, Room 424T, Austin, Texas 78701. JO Number TX7855845. Ad paid by an equal opportunity employer.

Programmer Analyst needed for software consulting firm located in Minneapolis, Minnesota. Job duties include Analyses of user requirements, networking, development of system design and program specifications; coding, testing, integration of business applications in multi-hardware, multi-software environments including SUN workstations and UNIX mainframes using relational database management systems. Specialize in design and development of GUI using Windows based application programming interface and toolkits. Will use Sybase databases, C, C++, Visual C++, Visual Basic, and TCP/IP and UCCP communication protocols. Applicant must have a B.S. degree in Computer Science. A foreign degree is acceptable if determined to be equivalent by a recognized authority. Applicant must also have 2 yrs. of exp. in the job duties described above or 2 yrs. exp. as a Programmer/Analyst which includes 2 yrs. in the analysis and design of business applications and 1 yr. exp. with Sybase databases, C, C++, Visual C++, Visual Basic, TCP/IP, UCCP, UNIX, SUN workstations, GUI. 40 hrs/wk, & 00 am - 5:00 pm, Mon-Fri. $52,000/yr. Send cover letter and resume to B. Abraham, #6-210, MDES, 390 North Robert Street, St. Paul, MN 55101

Programmer/Analyst - client loc in Portsmouth, NH; (Co loc in NY, NY) Analyze user's needs; design, develop system to standardize insurance claims forms; convert from Sybase to Object-Oriented database creating business objects as needed; design Macintosh GUI. Use: Sybase, C++, MFC, Object-Oriented program techs. No deg. req'd. 3yrs/exp. in job offered or 3yrs as Programmer. Exp. in job offered or related occ must incl. 18mos using Sybase, C++, MFC, Object-Oriented programming. 40hrs/wk (9-5, M-F) $42,000/yr. Send two (2) copies of resume/letters of application to: Job Order #96-0279, P.O. Box 889, Concord, NH 03302-0889.

Systems Engineer 40 hrs/wk, 8am-5pm. $49,220/yr. Design, develop, code & analyze software applications for information management & telecommunications system. Projects include: Fraud Force; Tandem emulator enhancement for ICE, UVS & IS41 messages; Fraud Manager IS41/X.25 Site Monitor Tools TANDEM: TAL/TACL, C, GNX OS IS41/X.25/SS7 Guardian-90 OS B.S. in Computer Science as well as 1 yr exp. in job offered or as Consultant required. Previous exp must include real-time system development, C, GNX or UNIX, TANDEM: TACL, IS41/X.25/SS7. Send resume to: Job Service of Florida, 2312 Gulf-to-Bay Blvd., P.O. Box C, Clearwater FL 34618-4090. RE: Job order #FL-1494804

SENIOR PROGRAMMER/ANALYST to analyze, design, develop and implement applications, rewrite modules, modify changes. Utilize SYBASE, TRANSACT SQL, MANMAN and QUERY Software. Requirements: Bachelors Degree in Computer Science, Engineering or Math 18 months experience as a Consultant or Systems Analyst. Such experience must include one year using SYBASE, TRANSACT SQL, MANMAN and QUERY Software. 40 hrs./wk. (8a.m. - 5p.m., M-F) Salary: $53,000/yr. Please send resume to Case # 51076, P.O. Box # 8968, Boston MA 02114

Software Engineer Design & develop client/server information systems for healthcare & medical claim processing. Graphical user interface (GUI) design. Tools: MS SQL Server, Visual Basic; ODBC Windows, M.S. in Computer Science as well as 1 yr exp. in job offered or as Programmer/Analyst required. Previous exp. must include design of software applications for healthcare systems, Visual Basic, ODBC, Windows, SQL. 40 hrs/wk, 8am-5pm, $42,500/yr. Send resume to: Julia Lawlor Healthnetwork, Inc., 1420 Kensington Road, Ste. 203, Oak Brook, IL 60521 (708) 954-2900.

Systems Analyst, Dallas, TX. Design, develop and maintain Manufacturing related software systems on BULL DPS mainframes using DM IV TDS OLTP systems and IDS II networking database using COBOL. Maintain and develop interfacing systems on PC LAN, UNIX using Visual Basic, COBOL 85, Microsoft Access and Informix database. Req'd. 3 yrs exp in job offered or 3 yrs as a Senior Programmer 40 hr/wk, 9am-5pm, Mon-Fri, $45,000/Yr. "Apply at the Texas Workforce Commission, DALLAS, Texas, or send resume to the Texas Workforce Commission, 1117 Trinity, Room 424T Austin, Texas 78701. JO # TX7855928 and "Ad Paid by An Equal Opportunity Employer"

ATTEND

Computerworld's New England Corporate Technical Recruiting Conference!

Monday, October 7, 1996

Boston Marriott Burlington, Burlington, Massachusetts

On October 7, 1996, you have a special opportunity to update your recruiting skills and network with recruiters in your area at the second annual New England Corporate Technical Recruiting Conference, held at the Boston Marriott Burlington, Burlington, Massachusetts.

A Full Schedule of Contemporary Topics

7:30am **Continental Breakfast & Conference Registration**

8:15am **Concurrent Sessions:**
- **The Critical Importance of Soft Skills and the "Invisible Assembly Line"**
  Karen W. Stanley, Vice President of Development, Priority Management Systems, Inc.
- **The Internet Primer: What is the Internet?**
  Marsha Stone-Martin, President, Linkmail Services

8:40am **Proactive Recruitment Techniques**
Dave Drugman, President, Bay Cities Research, Inc.

12:15pm **Luncheon Keynote:**
Coping with Technology: Help for the Paradigm Shifted
Maryfran Johnson, Executive Editor, Computerworld

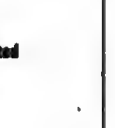
2:30pm **Concurrent Sessions:**
- **The Critical Importance of Soft Skills and the "Invisible Assembly Line" (repeat)**
- **The Recruiter's Guide to the Internet**
  Ginny Place, Human Resources Consultant

4:15pm **Town Hall Forum**
Jack Erdlen, Vice President, Strategic Outsourcing - Romac International

5:00p.m **Program ends**

Selected sessions include:

Proactive Recruitment Techniques

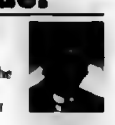


Dave Drugman, President, Bay Cities Research, Inc.
To remain competitive, today's technical recruiters need to be aware of the latest trends in sourcing and proactive recruiting. This in-depth session from a leading expert will explore this critical topic and will help you put your resources and expectations into proper perspective.

Industry Trends
Luncheon/Keynote Address

Maryfran Johnson, Executive Editor, Computerworld
Sure, there are new skills entering the market every day, but what are the trends that drive these skills? Maryfran Johnson, one of the industry's leading watchers of the Information Systems profession will give you an up-to-the-minute view in this very special keynote address.

Town Hall Forum



Jack Erdlen, Vice President, Strategic Outsourcing - Romac International
In this session, you'll not only be able to propose your specific questions for open discussion, you'll learn of real world issues and solutions from your peers. You won't want to miss this rare opportunity to Jack Erdlen, an expert in the HR field, leads us through this modern discussion of your recruiting topics.

For more information, call the conference hotline:
1-800-488-9204

SAP

We specialize in:
The placement of SAP professionals - all modules, ABAP/BASIS
Contract & Permanent Positions Available Nationwide.
We have low overhead so we can pay you top dollar.

People Unlimited
1911 Sardis Rd. N., Ste. 210
Charlotte, NC 28270
Phone 704-841-1118
Fax 704-845-1992

SOFTWARE DEVELOPERS

Our Windows of Opportunity Are Open.

Windows NT, that is.

At Dialogic, professionals at all levels of Windows NT and Windows 95 expertise can build an exciting, rewarding future with today's hottest company in today's hottest field. Of course, so can Unix developers.

As the trendsetter in open PC-based computer telephony systems, Dialogic offers the power of our open interactive multimedia and voice processing products to companies around the world. And now, our window of opportunity is open to you for a key role on our development team.

We're looking for Software Developers to develop and test Windows NT device drivers or Dialogic NT-native architecture for new and existing Dialogic products. This will involve working closely with teams across the organization to determine needs, develop functional and design specifications, and troubleshoot NT driver software problems.

Your background should include in-depth knowledge of the Windows NT operating system and the platforms on which NT runs (x86, AXP and PowerPC). You'll also need experience writing Windows NT device drivers and familiarity with NT platforms, multithreading/multiprocessing, interfacing to hardware interrupts, shared RAM or I/O port-based hardware peripherals, NT kernel debugger techniques and C/C++ languages.

For Unix developers, hands-on experience writing Unix device drivers and overall knowledge of the Unix, Solaris or AIX operating system and environment are required.

Don't shut the window to a rewarding future at Dialogic. Please e-mail your resume in ASCII text format to M.Ludlow@dialogic.com (to name your file, use the first 7 letters of your last name and first initial.txt). Or mail or fax your resume to: Dialogic Corporation, 1515 Route 10, Parsippany, NJ 07054; FAX: (201) 993-5762. An equal opportunity employer.

DIALOGIC

For more information about Dialogic and all employment opportunities, visit our Web site at http://www.dialogic.com

---

One of the largest and most prominent banks in the Middle East is offering excellent opportunities to qualified candidates for positions in Internal Audit.

COMPUTER AUDITORS

As a Computer Auditor in a team of ten staff, you will work independently on system and application reviews and also extensively with the Financial and Banking Services Auditors, planning and performing integrated business audits. Involvement in high risk development projects will be an integral part of the role. An element of travel within the Kingdom of Saudi Arabia will be required.

Key Requirements:

Candidates should be graduates, preferably in a business-related discipline, with at least ten years' banking experience, including five years in Internal Audit. Ideally, candidates should have the CISA or CICA qualification and have five years' experience in systems development. A comprehensive knowledge of banking and excellent report writing and presentation skills are required. The ability to communicate confidently and professionally to groups of other specialists and senior management is critical.

The successful candidates will receive a competitive financial package consisting of a tax-free salary (at source), furnished housing, annual vacation air tickets and an opportunity to participate in the rapidly evolving financial sector within Saudi Arabia. Candidates are requested to send their résumé urgently to:

RECRUITMENT DEPARTMENT
P.O. BOX 22613
RIYADH 11416
SAUDI ARABIA

FAX NO: 011 966 1-405-7353

By providing our professionals with a challenging environment, SAFCO Electronic Systems Division has become a leader in component and telecommunication product manufacturing. As we build upon our success, we continue to invest in talented professionals who are able to help us meet our future challenges.

- ✔ **FIELD SERVICE ENGINEERS**
- ✔ **SYSTEMS ENGINEERS**
- ✔ **SOFTWARE ENGINEERS**
- ✔ **EMBEDDED SOFTWARE ENGINEERS**
- ✔ **SALES ENGINEERS**

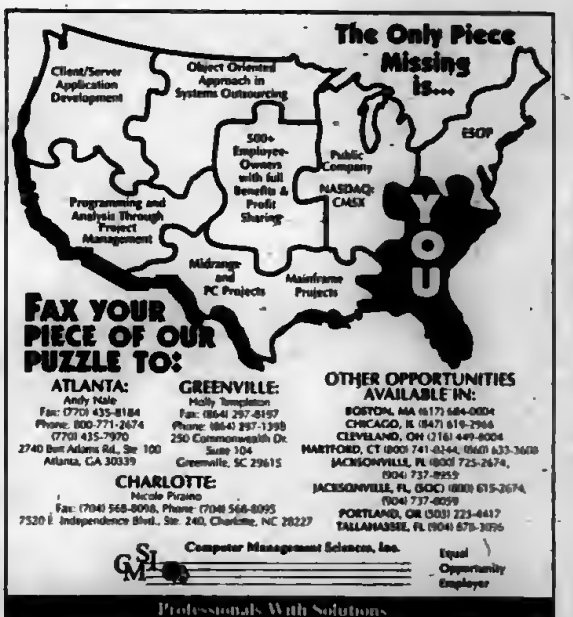
If you have demonstrated success in any of the above areas, find out more about the opportunities at SAFCO Electronic Systems Division. Send your resume with salary history to: Dept. CWSS, SAFCO Electronic Systems Division, 8800 Northwest Highway, Chicago, IL 60631. FAX 312/631-4838. HRM@SAFCO.com. EOE By Choice. Non-Smoking Environment.

SAFCO

Consultant. Design, develop, implement & test software applications for business clients using client/server & graphical user interface technology. Develop relational database applications. Tools: UNIX, C/C++, X-Windows/Motif; MS-Windows, Visual Basic; Access, Oracle, TCP/IP. Mainframe. M.S. in Computer Science as well as 1 year experience in job offered or as Software Consultant required. Graduate education or experience must include C, UNIX, TCP/IP, Oracle, Visual Basic, Access. 40 hrs/wk, 8am-5pm. $67,629/yr. Send resume to Gwen Malone, Human Resources, SEI Information Technology, 212 E. Ohio Street, Chicago, IL 60611-3203. (312) 440-8300

DATABASE ADMINISTRATOR

The Christian Broadcasting Network, located in Virginia Beach, Virginia, is seeking a qualified Database Administrator to work in its Information Technology Division. The successful candidate will possess the following qualifications: Knowledge of relational analysis and design concepts; experience in relational database technology; and experience in programming and testing, preferably in Transact SQL and/or Delphi or Visual Basic. Experience with ERI Case tool preferred. Experience in Object Oriented Analysis and Design a plus. If you meet the listed criteria and share our vision and purpose call our 24-hour line (800) 888-7884 to request an application.



ESPN, the leader in sports programming, is seeking a motivated professional who will work in a high energy environment at ESPN in Bristol, CT for one of the following opportunities:

MANAGER, FINANCIAL SYSTEMS

Responsibilities include development, implementation and operation of applications related to the financial and administrative areas. Requirements include Bachelors in Business, Computer Science, Accounting or equivalent experience. Proven leadership skills and hands-on experience with the ORACLE Financials package. Ade 1032

SYSTEMS ANALYST

Responsibilities include analysis, design, development and implementation of systems that support business processes and on air production functions. Requirements include Bachelors in Business, Computer Science or equivalent experience. Hands on experience with ORACLE Developer 2000. Ade 1033

SR. UNIX SECURITY ADMINISTRATOR/PROJECT COORDINATOR

Responsible for the evaluation, implementation and administration of hardware/software based security products including UNIX and NT/AS servers. Requirements include a minimum of 3 years in-depth experience with computer/network security issues, TCP/IP systems, knowledge of Internet proxy Firewalls and a minimum of one year managing projects. Ade 1034

NETWORK SUPPORT ANALYST

Provide technical support/service to corporate PC users and support the use and maintenance of local and network-based applications. Diagnose hardware failures and assist in the implementation, maintenance and administration of a network-based system. Ade 1035

ESPN offers a competitive benefits package, in addition to a stimulating work environment. Qualified candidates should send resume to: ESPN, Inc., Ade ___, ESPN Plaza, Bristol, CT 06010-7454, Fax: 860-585-2425 or email: (jones@espn.com (unencrypted and nonmined). No phone calls please.

Equal Opportunity Employer M/F/D/V

ESPN

ANALYST/PROGRAMMER - From client requirements develop specifications. From specifications analyze, design, develop, test, implement, document required software. Req Bachelor's in Computer Science/Engrng & 1 yr exp in job or related EDP occupation. Exp must incl PARADOX, NOVELL NETWORK. Troubleshoot to component level. Client Server using DB2 Gateway. $38,900/yr. 40hrs/wk. Mon-Fri, 9:00am-5:30pm. Job Site Chicago, IL. Must have proof of legal authority to work permanently in the U.S. Resume to Illinois Dept. of Employment Security, 401 S. State Street - 3 South, Chicago, Illinois 60605. Attn: Len Bolesa. Ref #V-IL15778-B. An employer paid ad. No Calls. Send 2 copies of both resume and cover letter.

Consultant, 40 hrs/wk, 8am-5pm, $51,000/yr Design, develop, implement & test software for management information systems using client/server & object-oriented technology. Tools: Visual C++, MFC, MS-Windows, ESQL, INFOMAN, Windows Sockets; TCP/IP; UNIX, ODBC. M.S. in Computer Science as well as 1 yr exp. in job offered or as Software Engineer required. Previous exp. must include: client/server technology; Visual C++, MFC, ESQL, INFOMAN, TCP/IP; UNIX, ODBC, Winsock. Send resume to: Job Service of Florida, 2312 Gulf to Bay Blvd., P.O. Box C, Clearwater, FL 34618-4090. RE: Job order #FL-1492820

Senior Software Developer. Analyze, develop and support MAC-PAC, a proprietary enterprise resource planning system software application product which runs on the IBM AS/400, to support manufacturing, distribution and financial requirements of manufacturing companies. Perform functional design by applying inventory accounting knowledge; review and analyze needs and business requirements of large ($100-$500 million) manufacturing companies; analyze and prioritize client system enhancement requirements to establish feasibility, necessary design plan and implementation; and train internal and client personnel to utilization of systems. Requirements: Bachelor of science in business administration plus one year experience as a Computer Analyst. Work experience must include: systems analysis, implementation and training in Enterprise Resource Planning Systems, business system terms applications for AS/400; and utilization of the following computer software: RPG 400, CL, DB/2 400 and OS/400. 40+ hr./wk. 9:00 a.m. - 5:00 p.m. $54,000/Yr. overtime pay exempt. Must have proof of legal authority to work permanently in the U.S. Send resume in duplicate to Illinois Department of Employment Security, 401 S. State Street-3 South, Chicago, Illinois 60605. Attention: Brenda Kelly, Ref No. V-IL 15748-K. An Employer Paid Ad. No calls.

Market Research Analyst needed for computer consulting firm located in Duluth, Georgia. Job duties include: Conduct market research analysis. Perform feasibility analysis, write marketing plans, and identify prospective clients. Establish research methodologies, examine and analyze statistical data to forecast future marketing trends in information technology areas. Collect data on customer preferences. Perform analysis using SWOT, SPSS, and SAS. Applicant must have a M.B.A. in Business Administration. Applicant must also have 1 yr. of exp. in the job duties described above or as a Market Analyst which includes 1 yr. exp. in market research analysis, feasibility analysis, writing marketing plans and analysis using SWOT, SPSS, and SAS. 40 hrs/wk, 8:00 am - 5:00 pm, Mon-Fri, $43,000/yr. Apply in person or by resumes to Georgia Department of Labor, Job Order # GA 8022970, 1535 Atkinson Road, Lawrenceville, GA 30243-5801 or the nearest Department of Labor Field Service Office.

Computer Consultant/Programmer Analyze plan, develop, test & implement customized business systems software applications. In providing clients with technical solutions, utilize the following computer-based methodologies: IBM ES 9000, IMS DB, DB2, VSAM, COBOL, JCL, MVS, MS-DOS, CICS, EXPEDITER, INTERTEST, TSO/TSPF, FILE AID, MICROFOCUS WORKBENCH. Assist in documenting developed software application. Take part in client transition to new system. Large percentage of time may be spent performing consulting services at client sites in various geographical locations. 40 hrs/wk, 8:30am-5pm, $46,000/Yr. Must have a Bachelor's degree in Computer Science or in a related field which involves a highly analytical & technical area of study such as Info Systems, Engr'g, Math, Physics, Business & Economics. Must have 2 yrs exp in the job offered or 2 yrs exp as a Computer Business Systems Software Development Specialist. Through education or work exp, must have acquired software development skills in each of the following computer-based methodologies: 1) MVS, 2) CICS, 3) DB2, 4) COBOL, 5) IMS DB, & 6) VSAM. Must be willing to travel to client sites throughout the US 25-50% of the time. Must have proof of legal authority to work permanently in the US. Send resume/ltr in dupl to: Illinois Dept of Employment Security, 401 South State St - 3 South, Chicago, IL 60605, Attn: Sheila Lindsey. Ref #V-IL 15507-L. An employer paid ad. No calls.

PROGRAMMER ANALYST (2 positions) 40 hrs./wk., 8am-5pm, $41,600/yr Carry out program analysis, program design, coding and testing of software systems for manufacturing applications utilizing COBOL, IDMS and INGRES. Req: Bachelor's degr in Computer Science Electrical or Mechanical Engrng, and 2 yrs. exprr in job offered or 2 yrs expr in Systems Analysis &/or S/W Engineering &/or Programming &/or Computer Consulting. Req: work experience developing S/W systems and with COBOL, IDMS and INGRES. Employer is S/W development/consulting firm. Relocation to client sites throughout the U.S. for periods of 6 mos. to 2 yrs. required. "Employer paid ad." E.O.E. Send resumes to: 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref. #116696.

Barnett ... Where Today's Big Idea Is Tomorrow's New Solution.

Exciting Opportunities in Northeast Florida!

At Barnett Banks, Inc., we're always at work on the next big idea... on solutions that set us apart in the financial services industry. We're striving to perfect our products and services - and our ability to deliver them - in order to keep outpacing the competition on every level. Shouldn't you be a part of the future we're shaping? Become a part of our success by joining us in one of the following openings at our beautiful **Jacksonville, Florida** headquarters.

SENIOR DATA ARCHITECT & DATA ADMINISTRATOR

Both positions are responsible for assessing cross functional data requirements and developing logical data models. Strong Information Resource Management concepts, strong data modeling skills and excellent facilitation skills are required, along with a demonstrated professional, customer-focused attitude with outstanding listening, negotiating and interpersonal skills. A Bachelor's degree in Business, Math or Journalism is preferred, experience with ERwin, Sybase and DB2 a plus. The SENIOR DATA ARCHITECT position also requires the ability to interact with all levels of technical and business management to coach, explain and advise regarding the benefits and requirements of architect, model based systems solutions. ***(Job Code EA076CW10)***

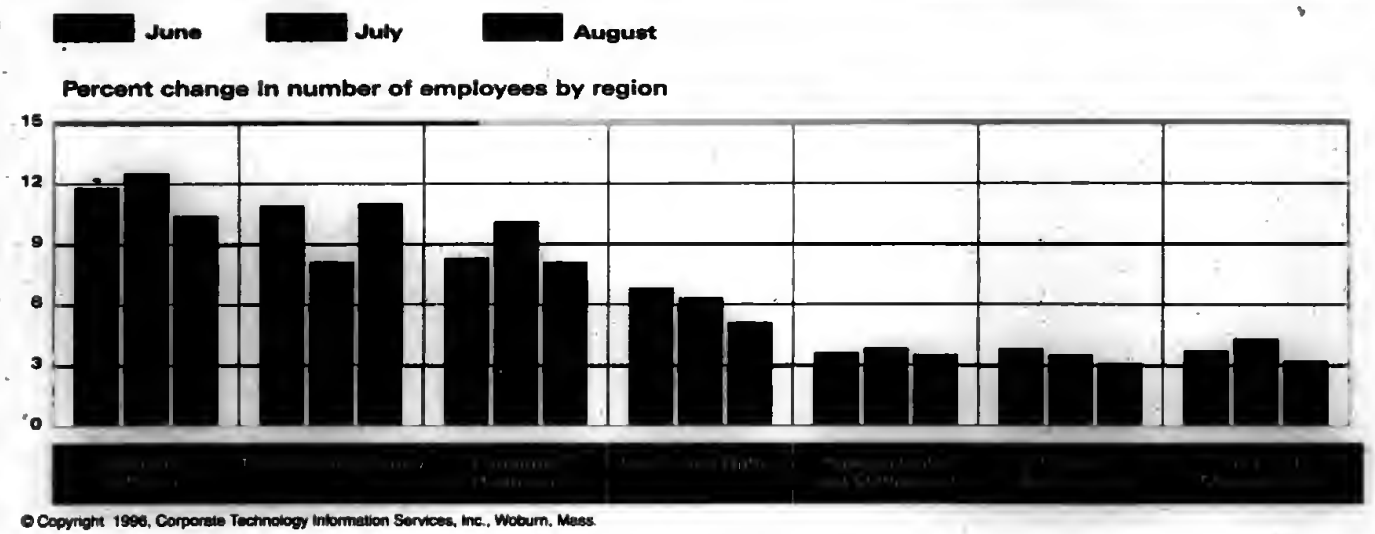
DATA WAREHOUSING/DATA MARTS DATABASE ADMINISTRATOR

Using relational databases in AIXRS6000/SP2 and DEC Alpha environments, you will be part of a Data Warehousing/Data Mart team and will interact with business clients, developers, data modelers and systems personnel, participate in data modeling sessions, develop physical database designs, and support production database installations. At least 3 years systems analysis and/or DBA experience; excellent technical and analytical skills, experience with physical relational database design techniques, database administration and performance tuning skills, and a working knowledge of AIX are required. Knowledge of Sybase, DB2/2, DB2/6000PE and Oracle is preferred. Production database support and troubleshooting experience desirable. ***(Job Code EA076CW11)***

With $41-billion in assets, Barnett is ranked among the top 25 financial services organizations in the country. Our commitment to continued leadership is reflected in our commitment to attracting and retaining the best and brightest people. Therefore, our compensation, benefits and professional development programs are unparalleled. For consideration, please fax/mail your resume, ***indicating appropriate Job Code***, to: **Barnett Banks, Inc., P.O. Box 44147, Jacksonville, FL 32231-4147. FAX: (904) 987-0325.** An equal opportunity employer. BARNETT SUPPORTS A DRUG FREE WORK ENVIRONMENT. "Barnett" is a registered trademark of Barnett Banks, Inc."

Barnett Technologies, Inc.

CorpTech Career Index



© Copyright 1996, Corporate Technology Information Services, Inc., Woburn, Mass.

Reach Higher

SEE US AT THE OOPSLA CONFERENCE

October 7-9, 1996

SAN JOSE CONVENTION CENTER, HALL 3, BOOTH 225

CapitalOne is committed to pushing the limits of object-oriented and distributed object technologies. We are seeking individuals who can bring ideas and experiences to help us fulfill this commitment. Opportunities in the areas listed below are available in Richmond, Virginia and in the Washington, DC metropolitan area. Relocation assistance may be available.

- ***OO Project Managers***
- ***OO Architects***
- ***OO Analysts/Designers***
- ***OO Developers (Sr./Jr.)***
- ***OO Test Engineers/SQA***

Experience with:
OO methodologies, OO modeling tools, CORBA, C++, Java, Smalltalk, ODBMS, Unix, WinNT Win95, NextStep/OpenStep

Stop by our Booth #225 and receive a FREE gift for dropping off your resume or business card. If you are unable to attend but want to interview with us while we are in San Jose, please call (800) 641-6943, ext. 8979 to set up an appointment. Or, send your resume to: Capital One, Human Resources, Dept. EAD1CW39A, PO Box 26349, Richmond, VA 23060-6349; FAX: (800) 310-9765; e-mail: careers@capitalone.com **Please indicate Dept. code EAD1CW39A on your cover letter or resume.** We are proud to be an equal opportunity employer.

CapitalOne
IT'S ABOUT INFORMATION

Shatter the boundaries of EDA Windows technology.

At the forefront of the electronic design automation (EDA) industry, Viewlogic Systems is harnessing the power of Windows technology to develop faster, more efficient design tools. Utilizing NT, MFC, OLE, DCOM and the Internet, we're creating and extending a variety of EDA applications. Exceptional hands-on opportunities exist for innovative Windows specialists to share in the excitement and rewards of this challenge!

Windows Development Engineers

Advance your career working with the best and brightest Windows professionals in the EDA industry at Viewlogic Systems. Keeping abreast of emerging technologies, you'll assume significant responsibility and contribute directly to the success of new Windows innovations on today's fastest growing EDA platform. To be considered, you must have a BSEE/CS, or equivalent, and 5+ years of experience developing successful products. Candidates must also have demonstrated expertise with C++ and MFC.

We offer an outstanding benefits package, including comprehensive medical and dental, incentive stock option plan, tuition reimbursement, 401(k) company match. Interested candidates should forward their resume to VIEWlogic Systems, Inc., Att: HR, 293 Boston Post Road West, Marlboro, MA 01752-4615, FAX (508) 481-0185, email: resumes@viewlogic.com

An Equal Employment Opportunity and Affirmative Action Employer

VIEWlogic

Software 2000 is adding Windows NT development to our list of successes. Already an industry leader on the AS/400 platform, we are taking our corporate commitment to quality, technology and growth to Windows NT. We are creating an exciting, challenging environment of the most current technologies: NT, OLE, C++, MFC, Active-X...and looking for the most talented people to help us get there. Since 1981, Software 2000 has helped companies worldwide solve their financial, materials management and human resource management related business issues with the use of our software, and the help of our support teams. We are growing! During 1996, Software 2000 has reported 91% growth in third quarter earnings, with a 120% increase in international revenue for the same period.

Better. Smarter. Faster.

The Power is in Your Hands

Opportunities exist in Waltham, MA

Director, Windows NT Development

Have you managed large teams in a software applications product-driven environment (i.e. D&B, Marcam, Lawson, Peoplesoft)? Have you overseen several successful releases of products built in a new NT development environment? The qualified candidate will also have at least 10 years software development, and 5 years management experience. MS/BS in CS or related degree required.

Manager, Windows NT QA

Are you a strong QA Manager with large scale applications systems experience in a product-driven environment? Do you have strong technical abilities in an automated testing, NT environment? The qualified candidate will also have at least 7 years experience in software product testing with at least 2 years of project management experience. MS/BS in CS or related degree required.

Manager, Windows NT Documentation

Are you a strong Documentation Manager who has experience in overseeing teams in the utilization of the newest, automated technologies? The qualified candidate will also have at least 7 years experience in software product documentation and 2 years project management experience. MS/BS in CS or related degree required.

Software Engineers

Software Engineers with NT, MFC, C++, and OLE, on either the applications or systems side. At least 3 years commercial development experience and MS/BS in CS or related degree required.

Software 2000, Inc. offers a competitive salary and quality benefits package. Our benefits package includes ESPP and tuition reimbursement. For confidential consideration, please contact Tone Iler, Technical Recruiter,at (617) 684-4575, fax (617) 684-4587, email tone_iler@s2k.com or mail your resume to Software 2000, Inc., 1000 Winter Street, Suite 4200, Waltham, MA 02154. **For more information about Software 2000, please visit our home page at http://www.s2k.com.** We are an Equal Opportunity Employer.

Software 2000

ATTENTION U.S. PROFESSIONALS!

Add your resume information to the Discovery Database and let all the consulting companies that are looking for your skillsets come to you. Assignments and/or positions are available nationwide for absolutely all skillsets. And it costs you absolutely nothing! If you want the added advantage, mail or fax your resume to:

The Discovery System

P.O. Box 37075, Kansas City, Mo. 64138
FAX (800) 585-6293, Voice (800) 222-8751

Assignments: Contract W2 ◆ Contract 1099 ◆ Contract for Hire ◆ Permanent Placement

Positions: Applications Programmer ◆ Database Administrator ◆ Network Administrator ◆ Programmer/Analyst ◆ Systems Analyst ◆ Systems Administrator ◆ Team/Project Leader ◆ Technical Writer

ISC

ARIZONA CONSULTING

OUR STAFF MAKES US #1.

WE NEED YOU TO KEEP US THERE!

We need highly motivated & experienced consultants with at least 2 years experience in one or more of the following:

MAINFRAME	DATABASE/CLIENT-SERVER
• SAS	• DB2 CONNECT
• COBOL II/370	• [illegible]
• DB2	• UNIDOF/C++
• IMS	• POWERBUILDER
• CICS	• VISUAL BASIC
• IMS or DB2 DBA	• JAVA/VisualC/HTML Web Developers
• ORACLE Developers	• ORACLE or SYBASE DBA
• Informix/4GL or C	• INFRA Apollo 3.0/3.5
	• Mainfrm

Please call, mail or fax resumes to:
Professional Software Consultants, Inc.
ELI ZINKER
4747 N. 7th St. #424, Phoenix, AZ 85014
(800) 279-4498, Fax (602) 279-4161
psinc41920@aol.com

SAP

- SAP R/3 (all modules)
- ABAP/4
- BASIS
- Windows/NT
- SAP R/2 (RF & RM) migration project/Nth East

Positions throughout the US Inc.

Microsoft Backoffice

- MCSE/MCPS (or in process)
- Exchange
- SQL Server/SMS/IIS
- Min. 1 year exp./ Backoffice Products

Check our Web Site WWW.AXISUS.COM

Headquarters in San Francisco, with offices in NY, NJ, Europe and Australia has exciting permanent or contract opportunities on the West and East Coasts. Send Resumes to Emi Acritano at Resume@axisus.com or fax to 415 434 2951 or ph 415 434 2947.

AXiS CONSULTING INTERNATIONAL
One Maritime Plaza, 24th Floor San Francisco, CA 94111

TANDEM
COBOL, PATHWAY, TAL, SCOBOL, C, SQL, X.25

STRATUS
PL1, COBOL, C, ON2

MUMPS UNIX
SUN, HP, RS/6000, GUI, SDR, Powerbuilder, C++, Visual Basic. Fulltime/Consulting Positions available in the US/ABROAD

STRATEM
800-682-JOBS
TEL: (516) 677-8888
FAX: (516) 677-1888
EMAIL: tom@stratem.com
7800 Jericho Tpke
Woodbury, NY 11797

PREMIER SYSTEMS, INC., a successful information systems company has immediate need for experienced consultants with any of the following skills:

- INFORMIX
- SYBASE DBA
- ORACLE DBA
- ACCEPTANCE TESTERS/QA

Please call or send resume to: Tariq Khan, PREMIER SYSTEMS, INC., Two Mid America Plaza, #800, Oakbrook Terrace, IL 60181 Phone: 708-614-8470 Fax: 708-614-6826. (eoe)

Marketplace

Conference WATCH

By Frank M. Hertz

There seems to be something extra about Unix Expo this year, and it isn't just the name change to Unix Expo Plus.

For starters, the "Plus" means there will be plenty of Windows NT in evidence — not just Unix. A host of conferences and special events will focus on the interoperability of the two platforms. Programs will include Unix and Windows NT Products and Strategies, Unix and NT Application Development and Integration, Unix and NT Systems and Network Management, and Real Business Solutions Using Unix and NT.

The "Plus" could also indicate the addition of an Internet conference and exhibit. The I² conference — which stands for intranet and Internet — focuses on all aspects of using World Wide Web technology for corporate and electronic commerce application development. An intranet track covers products and strategies in this latest medium; a Web design track helps attendees with a range of expertise, from simple Hypertext Markup Language programming to implementation.

According to Mark Havilland, a spokesman for conference sponsor Blenheim Group USA, Inc., "The 'Plus' signifies the direction that many IS managers are taking as they look at both Unix and NT to produce their applications and run their networks."

Blenheim expects more than 34,000 visitors and 400 exhibitors at the show.

Here's a sampling of what those visitors are looking for at this year's Unix Expo Plus:

Michael Pereira
Product development manager
Scholastic New Media, New York
"The show will be useful to understand what tools are available to seamlessly mesh different applications that require different operating systems. I want to find out about some of the 'gotchas' that exist between applications running on cross-platforms. We're also always looking to find someone who's particularly adept at solving our specific needs. There's also an opportunity to bump into our existing vendors and catch up on the customer support we should be getting."

Julie Hahnke
President
IDTech, Woburn, Mass.
"I like to identify from the brochure a conference session or two that I want to sit in on, which determines the day I attend the show. But I also like to leave a fair amount of time for the show floor, which is one of the most important things. I need to see what the major players are doing with their products and what new releases they're pushing and hawking. A lot of times it's 'vaporware' at the show, but it's important to see what direction they're heading in. I also like to see any new products that are coming along in different markets. And, of course, the parties are very important for networking."

Dennis Rossi
Programmer/analyst
Neuberger & Berman Management, Inc., New York
"I'm most interested in all the latest intranet and Internet development tools that are becoming available. There's so much going on in that area, and I need to stay on top of those technologies. I'm also looking at the Unix and NT side of things. I want to see where companies are going in terms of bridging the differences between the platforms."

Joseph Rosen
Managing director
Enterprise Technologies Corp., New York
"I employ the 'MBWA' technique — management by walking around. I like to forget my preconceived notions of what's important and see which exhibitors are attracting the most attention and where the crowds are. I also can go from conference to conference to see which are better attended. As a consultant, I have to know what's important to other people. I also want to hear about Unix and NT coexistence."

Frank Greco
President
Crossroads Technologies, Inc., New York
"This year, it's all Internet and Java. I'll be scouring the show floor for Java tools. All my clients are investigating Java as a replacement for C++, so I'll look at what people are doing to that end. I want to also look at Web site architecture tools. It's important to find products that are not just 'page builders' but add some real functionality and expandability."

Rod Zimmerman
President
Mobile Application Servers, Inc., St. Louis
"I want to address the porting, from NT to [Sun Microsystems, Inc.'s] Solaris, that my company is doing with [Crystal Services, Inc.'s] Crystal Reports. I'll be looking to Crystal Reports, which gives [us] the power that is mandatory in the SQL database market and helps us deliver parallel processing applications to the intranet and client/server markets."

Things to do in New York
In a word, *Rent*. The Broadway show has taken New York — and the world — by storm. You'd be extremely lucky to get a ticket from the box office, but it's worth a try. Call (212) 239-6200, or if you must, get a ticket from a scalper.

The Empire State Building, the Statue of Liberty and Rockefeller Center are inexpensive ways to experience the Big Apple.

Nightlife in New York speaks for itself. After a day at the show, you'll already know where all the fun will be had. ■

Hertz is a freelance writer in Boston.

COMPUTERWORLD Marketplace Vendor Center (800) 447-0018

A FREE SERVICE for our readers that's as easy as... 1 Call the Computerworld Marketplace Vendor Center at (800) 447-0018. 2 Ask for the extension listed in the product area you want information on. 3 Sit back and relax – your requested information is on the way.

Software
3780 RJE Emulation ..... ext. 517
Client/Server Development Tools ..... ext. 509
Groupware ..... ext. 511
Network Management ..... ext. 512
Remote Access ..... ext. 513
Security ..... ext. 516
Terminal Emulation ..... ext. 518
Utilities/Antivirus ..... ext. 502
Year 2000 ..... ext. 519

Computers/Peripherals
Back-up/Tape/Disk ..... ext. 216
Cabinets/Racks/Desktop PCs ..... ext. 201
Furniture ..... ext. 220
Kiosks ..... ext. 217
Mainframes ..... ext. 215
Midrange ..... ext. 219
Presentation/Projectors/Panels ..... ext. 205
Repairs and Maintenance ..... ext. 221
Security ..... ext. 218
Servers ..... ext. 214
Spark Microprocessors ..... ext. 222
Storage/RAID/DAT/Optical ..... ext. 209
Tapes/Disk Drives ..... ext. 207
Workstations ..... ext. 203

Networking/Communications
Client/Server Tools ..... ext. 603
Diagnostic/Testing Equipment ..... ext. 629
Ethernet ..... ext. 623
Groupware ..... ext. 606
Hubs ..... ext. 628
Internet Products/Services ..... ext. 634
Network Hardware ..... ext. 619
Network Management ..... ext. 607
Network Software ..... ext. 618
Networking/Communications TCP/IP Applications ..... ext. 626
Remote Access ..... ext. 608
Security ..... ext. 632
Storage/Cabinets/LAN Racks ..... ext. 615
Switches/Gateways/Bridges/Routers ..... ext. 612
Windows NT ..... ext. 617

Services
Consulting/Contract Programming ..... ext. 703
Conversions ..... ext. 707
Data Recovery ..... ext. 708
Outsourcing/Remote Computing ..... ext. 706
Training/Software Support ..... ext. 704
Year 2000 ..... ext. 710

Internet/Intranet
Application Development Tools ..... ext. 330
Browsers ..... ext. 305
Consulting ..... ext. 308
E-Mail Gateway ..... ext. 314
Encryption ..... ext. 312
Firewalls ..... ext. 314
Security ..... ext. 322

Get detailed product information direct from a variety of manufacturers.

Go Direct For Great Presentations

GO DIRECTLY TO THE SOURCE FOR THE LOWEST PRICES AND THE BEST SERVICE.

PROCOLOR 3080
$6499

BEACON 2500
28 lbs.

REVOLUTION
$6499
13.5 lbs.

PROCOLOR 2001
$4999
16 lbs.

PROCOLOR 1820
$2499
LCD 10.4" diagonal
6.5 lbs.
640 x 480

BOXLIGHT CORP.
Presenting A Better Way.™

Government: (800) 497-4009
Resellers: (800) 736-6956
International: (360) 779-7901
Rental: (800) 736-6954
Fax: (360) 779-3299
Education: (800) 689-6676
http://www.boxlight.com

TO ORDER, CALL
1 800 762 5757
Monday - Friday, 6am - 5pm PST. Purchase orders accepted.
Prices subject to change. Quantities may be limited to stock on hand.

Attention SynOptics System 3000 Customers

New Ethernet Desktop Switching, Shared Fast Ethernet Modules,

and

A Special Limited Time Offer For System 3000 Customers Only!

Visit our Web site at: http://www.baynetworks.com/s3000
or call 1-800-231-4208 or your local reseller for more details.

Bay Networks
People connect with us

A Great Buy Opportunity!

© 1996 Bay Networks, Inc. "People connect with us" is a trademark of Bay Networks, Inc.

Where IS Buyers Find Solutions

TO ADVERTISE, Call toll free: 1-800-343-6474 Ext. 7744

software • hardware • buy/sell/lease • services

- Conversion desktop size unit
- Full multimedia capabilities; video, keyboard, mouse, speakers, microphone, and serial support available

AutoBoot COMMANDER 1XP™

Cybex Computer Products Corporation
4912 Research Drive
Huntsville AL 35805 USA
1-800-932-9239 (205) 430-4030 fax
http://www.cybex.com

CYBEX

Distinct NFS 95

Easiest way to Share Files, Programs and Printers

Highlights:

- Integrates seamlessly into Windows 95
- Mounts NFS drives from Explorer or Network Neighborhood
- Supports file and record locking
- Allows central authentication with a single server running PCNFSD for all NFS connectivity
- Prints to NFS or LPD print servers
- Allows login to all systems with a single login name and password or different login names for each system
- Allows single-operation logout of all systems accessed through Network Neighborhood
- Fine tunes performance parameters for each server you access!

Free Evaluation Copy Available at...

distinct

408.366.8933
http://www.distinct.com
Fax: 408.366.0153
E-mail: cworld@distinct.com
Fastfacts: 408.366.2101

- Sales/1
- PCs
- Networks & Integration

Product Specialists
Pretested equipment
Flexible financing
Configuration planning
Offices nationwide
Technical support
Overnight shipping

Sales & Rentals

✓ Processors
✓ Peripherals
✓ Upgrades
✓ New
✓ Reconditioned
With warranty

http://www.dempseybox.com
e-mail: dempseybox@dempseybox.com

Dempsey BUSINESS SYSTEMS
2136 Michelson Drive · Irvine, CA 92612-1304
Phone: (714) 475-2900 Fax: (714) 475-2929

Buy • Sell • Rent (800) 888-2000

ALICOMP

Has a SMALL BUSINESS DIVISION which has serviced over 165 diverse clients. It specializes in providing VM, MVS, VSE service to clients who need:

•OUTSOURCING (Up to 10 MIPS)
•REMOTE COMPUTING
•TAPE CONVERSIONS
•SYSTEMS INTEGRATION CONSULTING
•YEAR 2000 SERVICES: Impact Studies and Automated Tools

Industry experience includes: •Financial Services •Non Profit •Software Developers •Healthcare •Manufacturing/Distributing •Publishing

We are the "Boutique" of the Computer Services World

(201) 319-8787 • (800) 274-5556

DATA INTERCHANGE and BACKUP SOLUTIONS SPECIALISTS

PC
HP
SGI
MAC
AS400
RS6000
NETWARE

QUALSTAR The Tape Experts — FUJITSU

The World's Best Tape Drives from the Tape Experts
QUALITY PERFORMANCE VALUE

DG
DEC
SUN
AT&T
SPARC
UNISYS

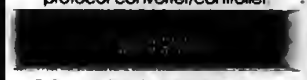
QUALSTAR The Tape Experts
1-800-468-0680
www.qualstar.com
FAX: (818) 592-0118
TEL: (818) 592-0061

Trademarks are the property of their respective owners

START ACTION!
Computerworld Marketplace Ads Get Readers Moving!

28%	make a purchase after seeing an ad
45%	call the advertiser for more information
41%	pass ads on to a co-worker
39%	save the ad for future reference

Call today to place your ad! (800) 343-6474, ext. 7744
COMPUTERWORLD PLACE

ENTERPRISE CONNECTIVITY
HYDRA® 3000
direct channel-attached multi-protocol converter/controller

- Block or Byte Channel Attached.
- Up to 4 Channels @ 256 CUUs Ea.
- Up to 256 Async Ports @ 57.6 Kbps.
- Concurrent SNA and Non-SNA 3270
- Up to 16 LANs @ 16/4 Mbps.
- SNA and Non-SNA Gateway PU.
- Modular Design for Easy Expansion.

FREE diskette with features, specs, pricing & late-breaking additions!
www.jdsm.com
800-554-9372
JDS MICROPROCESSING

WARNING
Without a ROSS hyperSPARC Upgrade, your workstation is too slow

- Full multiprocessing capability, up to four processors
- Fastest SPARC microprocessors in the industry
- For SPARCstation 10 and 20, and SPARCserver 600 series machines
- Range of processor/second level cache options available
- Fully SunSoft supported
- Take less than 30 minutes to install

1 800 663 1966
ROSS
Workstation Technologies, Inc.

Advertisers Index

Advertiser	Address	Page
Alicomp/CBS	(800) 274-5556	112
Bay Networks, Inc	http://www.baynetworks.com/s3000	111
Boxlight Direct	http://www.boxlight.com	111
Cybex Computer Products Corp	http://www.cybex.com	112
Dempsey	http://www.dempseybus.com	112
Distinct Corp	http://www.distinct.com	112
JDS Microprocessing	http://www.jdsm.com	113
Qualstar	http://www.qualstar.com	112
Ross Technology, Inc	(800) 621-4668	113

This index is provided as an additional service. The publisher does not assume any liability for errors or omissions

"The Computerworld Marketplace Vendor Center leads offer much more than names and phone numbers, they include detailed information on the company and their particular business concerns . . . nobody else's leads provide this level of detail."

Max Martin
President
TriniTech, Inc.

COMPUTERWORLD Marketplace

With your ad in Computerworld Marketplace, you receive additional leads from our unique Vendor Center. These leads include detailed information on the company and their purchase plans, as well as complete contact information - everything you need to begin your sales process.

Advertise in Computerworld Marketplace and start generating more sales.

(800) 343-6474, ext. 7744

Vendor Center

Advertisers Index

Aim Technology 20
Amdahl 77
http://www.amdahl.com
Compaq Computer Corp. 18-19, 78-79
http://www.compaq.com
Computer Associates 3
http://www.cai.com
Compuware 15
http://www.compuware.com
Digital Consulting Inc 42
http://www.dciexpo.com
Digital Equipment Corp. 25
http://www.digital.com
EDS 54
http://www.eds.com
EMC Corp. 120
http://www.emc.com
Exabyte 66-67
http://www.exabyte.com
Forté 17
http://www.forte.com
Hewlett-Packard 13, 58-59
http://www.hp.com
IBM 26-27, 51, 62-63
http://www.ibm.com
Information Builders 43, 45
http://www.ibi.com
Informix Software 11
http://www.informix.com
Kingston Technolgy ..... CA
http://www.kingston.com
Lawson Software 22-23
http://www.lawson.com
(800)477-1357
Lotus Development Corp. 94-95
http://www.lotus.com
(800) 343-5414
Lucent Technologies 30-31
http://www.lucent.com
Meckler Media 10
Micro Focus 7
http://www.microfocus.com
(800) 872-6265
Micron C3
http://www.micron.com
Microsoft 34-35
http://www.microsoft.com
Motorola 40, 90-91
http://www.motorola.com
NCR 57
http://www.ncr.com
(800)CALL-NCR x3000
NEC Technologies 37, 96
http://www.nec.com
Novadigm 68
http://www.novadigm.com
Novell 86-87
http://www.novell.com
Oracle Corp. 5
http://www.oracle.com
Pure Atria 80
http://www.pureatria.com
Red Brick 24
http://www.redbrick.com
SAS Institute 70-71
http://www.sas.com
SCO 89
http://www.sco.com
StorageTek 38-39
http://www.storagetek.com
Sun Microsystems 46-47, 60, 74-75
http://www.sun.com
Sybase 53
http://www.sybase.com
Symbios Logic 92
http://www.symbios.com
Unisys 9
http://www.unisys.com
(800) 874-8647 X100
Vanstar 21
http://www.vanstar.com
Workstation Group 50
http://www.wrkgrp.com

To have your Internet address listed here, please contact Paula Wright at (508) 620-7716

This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

Have a Problem With Your Computerworld Subscription?

We want to solve it to your complete satisfaction, and we want to do it fast. Please write to:

COMPUTERWORLD, P.O. Box 2043, Marion, Ohio 43305-2043.

Your magazine subscription label is a valuable source of information for you and us. You can help us by attaching your magazine label here, or copy your name, address, and coded line as it appears on your label. Send this along with your correspondence.

Address Changes or Other Changes to Your Subscription

All address changes, title changes, etc. should be accompanied by your address label, if possible, or by a copy of the information which appears on the label, including the coded line.

Your New Address Goes Here Address shown: ❑ Home ❑ Business

Name

Company

Address

City State Zip

Other Questions and Problems

It is better to write us concerning your problem and include the magazine label. Also, address changes are handled more efficiently by mail. However, should you need to reach us quickly the following toll-free number is available: **1-800-669-1002** Outside U.S. call (614) 382-3322. CompuServe members can reach us at account number 73373, 1230. Internet address: circulation@cw.com

Name / Company / Zip
Title / Phone
Address
City

COMPUTERWORLD allows advertisers and other companies to use its mailing list for selected offers we feel would be of interest to you. We screen these offers carefully. If you do not want to remain on the promotion list please write to the following address – COMPUTERWORLD, Circulation Department, 500 Old Connecticut Path, Framingham, MA 01701.

Computerworld, Inc.

CEO/ President Gary J. Beach
Senior Vice President/ Finance Matthew C. Smith
Vice President/ Human Resources Susan C. Perry
Executive Assistant to the CEO/President Karen E. Elliott

Computerworld

An IDG Company: The World's Leader in Information Services on Information Technology

Executive Vice President/Publisher
Michael R. Rogers

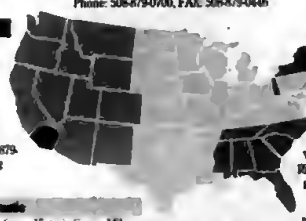
Computerworld Headquarters: 500 Old Connecticut Path, P.O. Box 9171, Framingham, MA 01701-9171
Phone: 508-879-0700, FAX: 508-875-4394

Editor Paul Gillin
Vice-President Sales/ Associate Publisher David Peterson
Vice-President Marketing Bob Winter
Vice-President Consumer Marketing Gail Odenesi

PUBLISHER'S OFFICE: *Assistant to the Publisher/* **MARKETING:** *Director, Marketing Communications/*Mary Doyle, *Senior Manager, Marketing Communications/*Elizabeth Phillips, *Manager, Trade Show & Conventions/*Audrey Abbott, *Marketing Manager/*Susan Thaxter, *Marketing Communications Project Manager/*Karen Lesko, *Marketing Specialist/*Emily Dinneen, *Administrative Assistant/*Patty White **CIRCULATION:** *Director of Circulation Management/*Maureen Burke **PRODUCTION:** *Production Director/*Christopher P. Cuoco, *Production Manager/*Beverly Wolff **SALES CLASSIFIED:** *Classified Operations Director/*Cynthia Delany **DISTRIBUTION:** *Distribution Manager/*Bob Wescott, *Traffic Manager/*Pat Walker **INFORMATION SYSTEMS:** *Vice-President of IS/*Walter Crosby

Sales Offices

Associate Publisher/Vice-President/Sales
-David Peterson
Computerworld Headquarters: 500 Old Connecticut Path, P.O. Box 9171 Framingham, MA 01701-9171
Phone: 508-879-0700, FAX: 508-879-0446



Regional Vice President: Sherry Driscoll, Senior District Managers: Bill Cadigan, John Watts, District Manager: Isabelle Kane, Sales Office Coordinator: Tammy Boisvert, Sales Assistants: Cheryl Stratton, Barbara Shannon, Diane McNeil, 470 Totten Pond Rd., 5th Floor, Waltham, MA 02154 (508) 879-0700 FAX: (617) 890-2699 Hearing Impaired: (800) 428-8244

Northwest

Senior District Manager: Darren Ford, Sales Assistant: Brenda Shannon, 14651 Dallas Parkway, Suite 304, Dallas, TX 75240 (214) 233-0982 FAX: (214) 701-9008 Hearing Impaired: (800) 622-6918

Vice-President Western Advertising Sales: Richard Espinoza, Senior District Managers: Ernie Chamberlain, Kaye Shattrough, Linda Hallroosh-Douty, Christine Curry, District Managers: Lisa Rowalski, Denyce Kehoe, HR Representative: Leticia Lebane, Operations Manager: Denise Hui, Sales Associate, CSF: Shannon Dempsey, Sales Associates: Tamara Haney, Andrea Zurek, Emmie Hung, Amy Blechman, Tidd Herrold, Marcy Walpert, Office Services: Jessica Abade, Sales Coordinators: Yvonne Zuniga, 500 Airport Boulevard, Suite 400, Burlingame, CA 94010 (415) 347-0555 FAX: (415) 347-8312 Hearing Impaired: (800) 900-3179

Mid-Atlantic

Senior District Managers: Fred LoSapio, Victoria Gonin, Mike Bachman, District Manager: Barry Cheney, Sales Assistants: Susan Kunnz, Jean Dellarobba, John Rudzinski, Mack Center 1, 385 West Passaic St., Rochelle Park, NJ 07662 (201) 587-0090 FAX: (201) 712-9786 Hearing Impaired: (800) 208-0288

Southeast

Regional Vice President: Bernie Hockenweder, Sales Assistant: Jennifer Patternaude, 1505 Woodington Circle, Suite 201, Lawrenceville, GA 30044 (770) 931-8104 FAX: (770) 931-8105 Hearing Impaired: (800) 449-4974, Senior District Manager: Mike Bachman, Sales Assistant: Mary Cavaliere, 175 Strafford Ave. #1, Wayne, PA 19087, (610) 975-4581 FAX: (610) 975-4582

Midwest

Senior District Manager: Sharon R. O'Brien, Sales Assistant: Denice Richards, 875 N. Michigan Avenue, Suite 2946, Chicago, IL 60611 (312) 943-6286 FAX: (312) 943-2214

Display Advertising Production Manager: Paula Wright, Display Advertising Coordinators: Lisa Tanner, Gregg Pinsky, (508)-879-0700 FAX: (508) 879-0446

Boston: Vice President/Larry Crowen, Director of Publishing Services/Carolyn Medeiros, Project Coordinator/Heidi Broadley, Managing Editor/Peter Bochner, Graphic Designer/Gail Varney, 500 Old Connecticut Path, Box 9171, Framingham, MA 01701-9171 (508) 879-0700 FAX: (508) 875-8310

San Francisco: West Coast Director/Elaine R. Offenbach, Sales Associate/Nikki Wilson, 500 Airport Boulevard, Suite 400, Burlingame, CA 94010 (415) 347-0555 FAX: (415) 347-8312

Vice President/Recruitment Advertising/John Corrigan, Marketing Director/Derek E. Hallisky, 500 Old Connecticut Path, Framingham, MA 01701-9171 (800) 343-6474

New England: Regional Manager/Nancy Percival, 470 Totten Pond Rd., 5th Floor, Waltham, MA 02154 (800) 343-6474, Account Executive/Nancy Mack, (800) 343-6474

Mid-Atlantic: Regional Manager/Marty Finn, Mack Center 1, 385 West Passaic St., Rochelle Park, NJ 07662 (201) 587-0080, Account Executive/Caryn Dlott, (800) 343-6474 TDD: (800) 208-0288

South-Atlantic: Regional Manager/Katie Kress, 8004 Professional Hill Drive, Fairfax, VA 22031 (703) 573-4115, Sales Manager/Pauline Smith (800) 343-6474

Midwest: Regional Manager/Pat Powers, 1011 East Touhy Avenue, Suite 550, Des Plaines, IL 60018 (847) 827-4433, Sr. Account Executive/Ellen Crom (800) 343-6474 TDD: (800) 227-9457

West: Regional Manager/Barbara Murphy, 2171 Campus Drive, Ste. 100, Irvine, CA 92715 (714) 250-0144, Sr. Account Executive/ Christopher Glenn (800) 343-6474 TDD: (800) 203-5867

Internet Careers Site: Jay Sweet, Account Executive, 500 Old Connecticut Path, Framingham, MA 01701-9171 (800) 343-6474

Associate Publisher: James Hussey, 500 Old Connecticut Path, Box 9171, Framingham, MA 01701-9171 (508) 879-0700 FAX: (508) 872-8364 **East:** Don Calamaro, 1056 Windsor Park Lane, Havertown, PA 19083 (610) 446-5372 FAX: (610) 446-5753

West: Sharon Chin, 500 Airport Boulevard, Suite 400, Burlingame, CA 94010 (415) 347-0555 FAX: (415) 347-8312

500 Old Connecticut Path, Framingham, MA 01701-9171 (800) 343-6474

Sales Manager/Michelle Reeves, Sales Assistant/Christine Tenerson, **Northeast** Account Executive/Laurie Gomes, **Central/Southeast** Account Executive/Ann Meleney, 500 Old Connecticut Path, Framingham, MA 01701-9171 (800) 343-6474 FAX: (508) 820-0041 **Western** Account Executive/Claude Garibaldo, 500 Airport Blvd., Suite 400, Burlingame, CA 94010 (415) 548-5544 FAX: (415) 343-3023

Director/Elizabeth Cooper, Sales Associate/Nancy Dillon, 500 Airport Boulevard, Suite 400, Burlingame, CA 94010 (415) 347-0555 FAX: (415) 347-8312

Vice President/General Manager: Richard Mikuta, Vice President: John Carpenter

Computerworld VAR Database: Carol Mullen/National Sales Manager. Account Executive/Sean Weglage, (508) 879-0700 FAX: (508) 879-0184

Computerworld Buyers Database East: Regional Manager, Database Services/Linda Clinton, (508) 879-0700 FAX: (508) 879-0184

Computerworld Buyers Database West: Regional Manager/, Gena Haas, (415) 347-0555 FAX (415) 347-8312

Chairman of the Board, Patrick J. McGovern, **President,** Kelly Conlin, **Chief Operating Officer,** Jim Casella

Computerworld is a publication of International Data Group, the world's largest publisher of computer-related information and the leading global provider of information services on information technology. International Data Group publishes over 275 computer publications in over 75 countries. Ninety million people read one or more International Data Group publications each month.

Business Objects stumbles after new release, 116

Finance & Investing

Next week: Stockholders connect online

The 'net Police

By Rosemary Cafasso

With all the talk of online fraud these days, it's a wonder investors are willing to use the Internet at all. Well, there may be scam operators lurking online, but more and more organizations are determined to hunt them down.

The newest cop on the beat is NASD Regulation, Inc., which last month launched a World Wide Web site (www. nasdr.com) to provide investors with guidelines for online investing as well as reports of fraud or suspicious online activity. It joins other big guns such as the Securities and Exchange Commission (SEC) and the National Consumers League, which already have sites set up for handling complaints and reporting investor-related fraud.

The SEC's complaint forum, which can be found on the agency's main Web site (www.sec.gov), went live this summer and logs in about 50 comments a day, including complaints about online activity, says Gary Sundick, an associate director at the SEC's division of enforcement. The SEC also has separately monitored the Internet for nearly a year and has pursued seven fraud cases as a result, Sundick adds.

Meanwhile, the National Consumers League in Washington has been operating since February a National Fraud Information Center Web site (www.fraud.org), which includes an Internet Fraud Watch. The group plans to announce next week the top five types of scams it has uncovered on the Internet since the site's launch. Its findings will show the No. 1 scam, based on volume of complaints, is the pyramid scheme.

Gotcha

Pyramid schemes are usually complex investment scams that promise big returns. Typically, the operators don't actually invest in anything. Instead, they generate new money by luring new investors. As cash comes in, it is split among the operators and existing investors, who think they are getting returns on a real investment. Eventually, the National Consumers League says, the scam collapses when it can no longer bring in new investors.

All of the organizations say they want to make the Internet a safer place for investors by targeting shady operators who are offering a variety of bad deals, including bogus stock tips. That's why NASD Regulation recently went online.

Steve Mansor

Tips for safe investing

1 [redacted]

2 [redacted]

3 [redacted]

4 [redacted]

5 [redacted]

. . . and if you need help, contact

- The National Association for Security Dealers Regulation, Inc. at www.nasdr.com or (301) 590-6500
- The Interactive Services Association for its online guide for investors at www.isa.net/protocol/investguides/html/
- The National Fraud Information Center at www.fraud.org or (800) 876-7060
- The U.S. Securities and Exchange Commission online at www.sec.gov or the Office of Investor Education and Assistance at (202) 942-7040
- The SEC Enforcement Internet Fraud Hotline at (202) 942-4647

Source: NASD Regulation, Inc., Washington

The group had heard its share of stories about suspicious Internet activity and decided it needed to be more proactive, says Clark Hooper, senior vice president of the office of disclosure and investor protection at NASD Regulation. "We felt we needed to make a stronger push to directly caution the investing public," Hooper explains.

The organization, which is the regulatory arm of the National Association of Securities Dealers, Inc., two weeks ago expanded its site by adding an investor complaint forum to give individual investors a more efficient way to report problems. It is also building a section that lists firms and brokers who have been fined or sanctioned, so investors can get the lowdown on someone before doing business with them.

NASD Regulation also recently teamed up with The Motley Fool, one of the hottest investor forums, to help handle investor complaints. The Motley Fool built a link to NASD Regulation's Web site that can be accessed from its main index, so visitors can send questions, raise concerns or report problems to NASD Regulation.

While these organizations have made Internet activity a top priority, they can't pin down the overall number of online scams, nor can they say for sure if there is a big upswing in illegal activity. They all maintain, however, that the Internet is ripe for scam operations because of the anonymity it provides message posters and the potentially huge audiences it can reach.

Even so, some industry players, such as Motley Fool co-founder Dave Gardner, say that while they applaud efforts by such groups as NASD Regulation, they also believe the focus on online fraud can be misleading to investors. Essentially, Gardner claims that the attention to Internet scams incorrectly suggests there is something unique to the online world that perpetuates fraud. He and other online fans say investors need to be their own first line of defense and use caution, whether they are conducting business online, by telephone or in person.

Adds Doug Gerlach, a private investor who operates his own Web site (www.investorama.com): "I don't believe that being on the Internet makes it easier to be defrauded. Someone can set up a scheme with a fax machine and fake letterhead.... People can be smooth-talked over the phone. The technology is not the problem."

The Week in Stocks

Gainers

PERCENT

Datatec Industries Ltd.	43.6
Madge Networks NV	38.6
Software Publishing Corp.	36.4
Xyvision	27.6
Stone & Webster	25.0
Chase Logic	21.6
Micro Semiconductor Inc.	20.3
Intergraph Corp.	20.3

DOLLAR

US Robotics	6.50
Xylan Corp.	5.88
3 COM Corp. (H)	5.06
Cognex Inc. (H)	5.06
Informix Corp.	4.75
Micro Semiconductor Inc.	4.69
Chase Logic	4.19
Broadband Technologies	4.00

Losers

PERCENT

Aldus Corp. Inc. (L)	30.1
Mentor Graphics	21.8
Secure Computing Corp.	21.4
Stratagenic Corp.	18.8
State of the Art	17.7
Dell Computer Corp. (H)	13.4
Compuserve Corp.	13.0
Digital Equipment Corp.	12.7

DOLLAR

Dell Computer Corp. (H)	11.75
AT & T	5.50
Digital Equipment Corp.	5.13
Microsoft Corp. (H)	3.25
Cambridge Tech. Partners (H)	3.25
Sequent Computer Corp.	3.00
DSC Communications	2.88
MCI Communications Corp.	2.88

Industry Almanac

Better to be good than quick

Sometimes overly ambitious scheduling can have dramatic financial consequences. A recent case in point, according to Wall Street analysts, is Business Objects SA (Nasdaq:BOBJY).

Having missed the release date for Business Objects 4.0, its database query and reporting tool, the company then rushed it to market, analysts say. Following that, bugs, bad reviews and further product delays hurt sales and dragged down earnings. These problems left a blot on the company's balance sheet and sent the stock price on a steep descent.

The company "was a little too intent on making release dates instead of coming out with a stable version" of Business Objects 4.0, says Jim Pickrel, a market analyst at Hambrecht & Quist, Inc. in San Francisco. The product had "stability and performance problems across platforms."

Because its latest release was a 32-bit version aimed at the Windows 95 market, Business Objects was also hurt when the Microsoft Corp. operating system didn't sell as quickly as anticipated, Pickrel added.

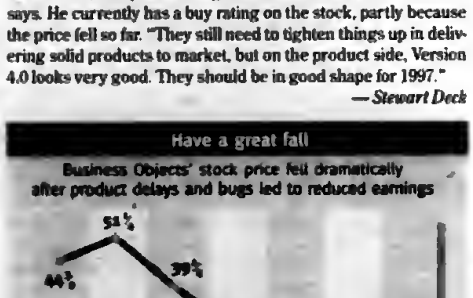
The stock also rose extremely fast earlier in the year because the company had the first meta-cube end-user tool on the market. "Investors gave them too much credit for that," said Roxane Googin, an analyst at Grunthal & Co. in Beverly Hills, Calif. "There is starting to be similar technology out there from other vendors like **Informix Corp. [Nasdaq:IFMX]**."

However, the product bugs have been worked out, Pickrel says. He currently has a buy rating on the stock, partly because the price fell so far. "They still need to tighten things up in delivering solid products to market, but on the product side, Version 4.0 looks very good. They should be in good shape for 1997."

—Stewart Deck

Have a great fall

Business Objects' stock price fell dramatically after product delays and bugs led to reduced earnings



Ends	52-Week Range			Sept 27 Wk Net	Wk Pct	Sept 27 Wk Net	Wk Pct
				2 P.M.	Change	2 P.M.	Change
COMS	45 63	33 50	3 COM Corp. (H)	67.56	5.00	8.8	
AIT	66 88	49 63	Ameritech Corp	53.25	1.50	3.6	
T	68.88	49.25	AT & T	51.38	3.50	-9.3	
ASND	71.25	36.50	Ascend Communications	66.75	3.75	6.3	
BNYN	13 63	5.00	Banyan Systems Inc. (L)	5.50	0.00	0.0	
BAY	50 00	20 25	Bay Networks Inc.	28.23	-0.88	-3.6	
BEL	80 50	43 50	Bell Atlantic Corp	59.23	0.88	1.5	
BLS	45 88	35.25	BellSouth Corp	36.25	-1.63	-4.3	
BBRT	36 75	8.88	Brooktrout Technology	36.23	4.00	12.4	
CS	87 75	53 00	Cabletron Systems	69.75	-0.25	-0.4	
CSCC	82.00	14 00	Cascade Communications (H)	81.75	0.75	0.9	
CGRM	25 13	12.25	Centigram Communications	13.50	-0.44	-3.7	
CSCO	61 50	50 50	Cisco Systems Inc. (H)	63.25	2.19	3.6	
CLIX	9 21	4 50	Compression Labs Inc	7.88	0.50	7.1	
CMNT	10.50	4.00	Computer Network Tech.	5.75	0.13	2.2	
XCOM	14.25	7.25	CrossCom	7.63	-0.50	-6.7	
DIGI	62 00	21.88	DSC Communications	29.38	-2.88	-9.6	
FORE	44 75	15 50	FORE Systems Inc.	41.38	1.50	3.4	
GDC	21.88	9 13	General Datacomm Inds	13.38	-0.50	-4.2	
GSX	42 50	28.00	General Signal Networks	67.50	+ 1.50	3.7	
GTE	69 25	36 63	GTE Corp	38.13	-0.88	-2.1	
LU	43 63	29 75	Lucent Tech. (H)	43.63	2.50	6.1	
MADGF	88 63	9 13	Madge Networks NV	32.38	1.75	28.6	
MCIC	31 13	22 50	MCI Communications Corp	24.75	2.88	10.4	
MNPI	34 50	5 50	Micrognosis Inc	8.69	-0.25	-3.9	
METM	14.00	7.63	NetManage Inc.	9.38	0.50	6.1	
NTRX	10.88	5.63	Netrix Corp	7.75	0.00	0.0	
NCDI	10.21	2.88	Network Computing Devices	5.88	0.75	14.6	
NWR	42.00	11 13	Network Equipment Tech.	13.25	0.50	3.8	
NETG	27.63	15.00	Network General	23.63	0.25	1.1	
NN	74.25	25.00	Newbridge Networks Corp	66.50	-2.00	-2.9	
NT	58.88	31 50	Northern Telecom Ltd (H)	58 13	3.63	6.1	
NOVL	19 25	10 00	Novell Inc.	11.38	0.25	2.1	
NYN	59.25	42.00	Nynex Corp	43.25	-0.50	-1.1	
OCTL	31.50	13.63	Octel Communications Corp	29.50	0.00	0.0	
ODSI	40.25	16.50	Optical Data Systems Inc.	16.88	-0.88	-4.9	
PAC	35.25	23.88	Pacific Telesis	33.00	-1.00	-2.9	
PCTL	66.72	20.73	Picturetel Corp	35.50	-0.50	-1.0	
PTON	9.75	2.38	Proteon Inc.	3.25	0.00	0.0	
RACO	7.13	3.50	Racotek Inc	5.38	0.63	13.2	
RETX	10.88	1.81	Retix	8.13	0.00	0.0	
SBC	80.25	68.00	SBC Communications	67.25	-1.63	-3.3	
SFA	29.50	11.38	Scientific Atlanta Inc.	13.75	1.00	6.8	
SHVA	87.25	21 13	Shiva Corp	59.00	-3.00	-4.7	
FON	45.50	29.25	Sprint Corp.	50.68	-2.13	-5.2	
SMSC	23.50	10.75	Standard Microsystems Corp	14.19	0.94	7.1	
TBIT	13.88	7.50	Telebit Corp	13.13	0.13	1.0	
USRX	105.50	32.25	US Robotics	72.50	6.50	9.8	
USW	48.50	32.25	U S West Inc.	29.50	-0.63	-2.1	
XIRC	17.50	8.88	Xircom	16.89	1.50	9.0	
XYLN	76.00	34.00	Xylan Corp	57.50	5.88	11.4	
AALR	10.38	5.88	Advanced Logic Research	8.63	0.50	6.1	
AAPL	47.50	16.00	Apple Computer Inc.	22.25	-1.00	-4.3	
ASTA	50.75	4.00	AST Research Inc	4.88	0.13	2.6	
CPQ	80.50	35.00	Compaq Computer Corp	63.75	1.00	1.5	
DELL	87.50	23.00	Dell Computer Corp (H)	75.75	11.75	-13.4	
GATE	50.13	18.00	Gateway 2000 Inc.	47.88	-2.00	-4.0	
HWP	57.75	36.88	Hewlett Packard Co	47.50	1.38	-2.8	
MUEI	27.38	8.75	Micron Interntational Inc	58.88	-0.50	-2.8	
NIPNY	20.75	69.88	NEC America	58.25	3.50	6.2	
SGI	38.75	20.00	Silicon Graphics	31.50	-2.63	-10.9	
SUNW	67 13	26 38	Sun Microsystem Inc	63.75	2.00	3.2	
AMH	13 50	6.75	Ambahl Corp.	9.50	0.00	0.0	
DGN	19 13	8.88	Data General Corp	14.00	0.63	4.2	
DEC	76.50	50 50	Digital Equipment Corp	34.38	-5.13	12.3	
IBM	128.88	83 13	IBM	125.00	0.63	0.5	
MDCD	20.25	6.50	Meridian Data Inc	7.50	0.13	1.3	
NETF	7.13	2.63	NetFrame	2.81	-0.13	-4.3	
SQNT	22.63	10 13	Sequent Computer Sys	12.75	0.00	0.0	
SEQS	7.88	1.88	Sequoia Systems Inc.	3.69	0.44	19.4	
SRX	36 13	16 63	Stratus Computer Inc	29.13	1.50	7.3	
TDM	13.25	8.38	Tandem Computers Inc.	11.50	-0.75	-6.1	
UIS	9 13	5.38	Unisys Corp	6.00	0.00	0.0	
ADBE	74.25	28.50	Adobe Systems Inc	37.75	0.00	0.0	
AMSWA	8.75	3.63	American Software Inc.	6.13	0.56	10.1	
APLX	67 50	8.25	Applix Inc.	28.00	-0.75	-2.6	
ARSW	12.75	29.75	Arbor Software	43.25	0.25	0.6	
ADSK	88.00	50.50	Autodesk Inc	26.50	0.81	3.2	
BGSS	50.00	29.75	BGS Systems Inc	43.25	0.00	0.0	
BMCS	55.75	32.50	BMC Software Inc	87.38	0.50	0.5	
BOOL	26.25	19.50	Boole and Babbage	25.25	-0.50	-1.9	
BORL	71.25	6.06	Borland Int'l. Inc.	6.88	0.13	1.8	
BOBJY	51.50	13.75	Business Objects	18.75	3.75	25.0	
CAYN	11.88	4.00	Cayenne Software Inc	4.19	-0.06	-1.5	
CYE	27.88	14 13	Cheyenne Software Inc.	31.75	1.75	8.8	
COGNF	31.21	9.75	Cognos Inc. (H)	31.06	5.06	19.5	
CA	63 50	34.88	Computer Associates (H)	60.00	1.88	3.0	
CYM -	13.50	5.75	Computervision Corp	8.88	0.25	2.7	
CPWR	46.50	15.50	Computware Corp.	43.75	1.25	-2.8	
CSRI	32 00	10.75	Comshare Inc.	15.50	0.19	1.2	
COSFF	19 13	8.25	Cosel Corp	8.94	-0.19	-2.1	
DWTI	13.75	3.75	Datawave Technologies Inc.	8.75	0.00	0.0	
FILE	67.00	20.00	Filetek Corp	24.00	1.25	5.5	
FRTE	81.75	24.75	Forte Software	35.63	2.50	6.3	
FTPS	60.63	5.88	FPP Software Inc.	7.88	0.50	5.8	
GPTA	9.50	3.00	Gupta	4.63	1.00	27.6	
HUM	28.88	13.00	Humminbird Comm Ltd	20.13	-0.75	-3.6	
HYSW	28.50	9.75	Hyperion Software Corp	13.38	-0.50	-3.1	
IRIC	16.25	10.00	Information Resources	17.31	0.75	6.0	
I MX	17.75	16.88	Informix Corp	29.13	1.00	3.9	
INGR	20 13	8.61	Intergraph Corp	10.25	0.13	1.2	
LEAF	12.63	2.50	Interleaf Inc.	3.50	0.13	3.7	
ISLI	22.00	7.50	Intersolv Inc.	9.25	1.38	17.5	
INTU	89.21	27.25	Intuit Inc.	33.00	1.63	5.2	
LGWX	22.75	7.50	Logic Works (L)	8.00	-0.25	-3.0	
MANPS	13.25	7.50	Manpro Corp	10.13	-0.13	-1.2	
MATH	9.75	6.63	MathSoft	5.25	0.00	0.0	
MCAF	71.50	17.63	McAfee Associates	20.25	-0.75	-3.1	
MENT	22.88	9.44	Mentor Graphics	9.44	2.63	-21.8	
MIFGY	31.25	8.25	Micro Focus	12.50	-0.50	-2.9	
MGXI	18.81	5.88	Micrografx Inc. (L)	3.94	2.50	-30.1	
MSFT	149.63	79.88	Microsoft Corp (H)	134.13	2.75	-2.2	
DDDDF	6.00	3.56	New Dimension Software Ltd	5.19	-0.08	1.1	
ORCL	44.50	23.38	Oracle Corp (H)	43.00	-1.25	-2.6	
PMTC	52.50	35.88	Parametric Technology	50.63	0.13	0.2	
PARQ	14.63	3.63	ParcPlace Systems Inc (L)	3.75	-0.13	-3.2	
PSFT	81.50	50.25	Peoplesoft	81.00	0.50	0.6	
PTEC	20.50	9.88	Phoenix Technologies	17.38	-0.75	-3.6	
PSQL	17.75	3.13	Platinum Software	11.00	1.00	10.0	
PLAT	22.25	9.75	Platinum Technology	12.38	1.50	11.5	
PRGS	50.00	33 13	Progress Software Corp	35.25	-0.50	-1.2	
RNBO	25.50	14.63	Rainbow Technologies Inc	17.13	-1.13	-6.2	
REDB	81.60	18.25	Red Brick Systems Inc.	23.75	1.50	6.7	
ROSS	8.13	2.19	Ross Systems	5.88	0.44	8.0	
SAPE	58.25	29.21	Saphire Corp.	45.75	4.75	13.6	
SCOC	9 13	5.50	SCO Inc.	6.88	0.13	1.9	
SDTI	109.00	22.25	Security Dynamics Tech.	71.00	2.75	4.0	
SFEY	89.50	13.38	Software International Inc.	19.63	1.63	9.0	
SPCO	4.75	1.19	Software Publishing Corp	2.00	0.44	28.0	
SQAX	39.75	16.00	SQA Inc.	25.00	-0.75	-2.9	
SOTA	19.75	9.00	State of the Art	13.31	-2.44	-17.7	
SSW	81.50	40.00	Sterling Software Inc.	26.50	1.50	1.0	
SDRC	37.50	15.00	Struct. Dynamics Research	24.13	-0.88	-3.5	
SYBS	58.75	16.13	Sybase Inc.	14.50	-2.00	-12.1	
SYNC	30.00	0.75	Symantec Corp	11.19	0.31	2.9	
SNPS	50.50	23.00	Synopsys	40.00	-3.00	-6.2	
SSAX	29.00	8.25	System Software Assoc	12.63	1.75	11.0	
SYSF	38.50	6.50	Systemsoft Corp	13.75	1.00	-2.9	
TRUV	9.63	4.50	Truevision Corp	5.50	0.63	12.8	
VIEW	32.50	9.63	ViewLogic Systems	13.75	0.44	3.9	
VMRK	15.75	3.75	Vmark Software Inc.	7.13	0.00	0.0	
WALK	12.25	8.25	Walker Interactive Systems	11.50	0.13	-1.1	
WALL	27.50	13.88	Wall Data Inc.	22.75	-1.25	-5.2	
WANG	26.13	14.50	Wang Laboratories Inc.	19.19	0.00	0.0	
AOL	71.00	34.50	America On Line	36.50	-0.63	-1.8	
BBN	48.75	15.63	BBN Corp	33.63	-0.50	-2.8	
CSRV	35.50	10.75	Compuserve Corp	14.25	-2.13	-13.0	
EDFY	55.75	36.25	Edify Corp.	20.00	-1.25	-5.9	
LCOS	29.25	5.75	Lycos Inc	12.88	1.38	12.9	
NETC	91.50	15.50	Netcom On-Line	37.50	-0.75	-4.1	
NSCP	87.00	28.00	Netscape Comm Corp.	49.75	-0.25	-0.5	
OMKT	67.25	31.50	Open Market Inc. (L)	13.88	0.50	3.7	
PSIX	19.00	0.75	PSINet	11.75	1.00	-7.8	
QDER	50.50	5.61	Quarterdeck Corp.	7.13	-0.88	-10.9	
RAPT	50.25	12.13	Raptor Systems	17.75	1.88	11.8	
SCUR	64.50	11.00	Secure Computing Corp	14.00	-3.00	-21.4	
SPYG	63.00	12.88	Spyglass Inc.	19.25	0.13	0.7	
YHOO	43.00	15.50	Yahoo! Inc	21.75	-0.75	-3.3	
AMD	52.88	10.21	Advanced Micro Devices	14.50	0.00	0.0	
ADI	30.13	17.00	Analog Devices Inc	27.75	0.13	2.8	
CHPS	14.50	7.88	Chips and Technologies	13.75	0.25	5.8	
CRUS	58.63	12.83	Cirrus Logic	29.63	4.13	25.0	
CY	20.38	9.13	Cypress Semiconductor Corp.	12.88	0.50	3.0	
CYRIX	65.50	11.50	Cyrix	13.25	1.63	12.9	
INTC	98.50	89.81	Intel Corp. (H)	97.00	-0.25	-0.8	
LSI	62.50	17.00	LSI Logic Corp	13.88	-0.13	-0.5	
LSCC	67.50	19.75	Lattice Semiconductor	29.63	-0.13	-0.4	
MCRL	28.00	12.00	Micrel Semiconductor Inc.	23.63	4.63	24.3	
MU	86.75	36.63	Micron Technology	31.13	3.63	13.2	
MOT	79.50	44.75	Motorola Inc.	51.50	-0.50	-0.7	
NSM	29.63	13.00	National Semiconductor	29.63	3.50	3.8	
TXN	83.75	80.50	Texas Instruments	84.50	0.88	1.6	
VLSI	36.75	10.50	VLSI Technology	16.25	1.63	13.1	
XLNX	31.25	23.25	Xilinx	36.50	-0.50	-1.6	
ZLG	42.50	14.88	Zilog Inc.	19.25	1.25	6.9	
APCC	35.87	7.88	American Power Conversion (H)	15.13	-0.13	-0.8	
ADPT	61.50	35.00	Adaptec Inc.	47.63	2.00	3.6	
CBEX	11.75	3.00	Cambex Corp	3.50	-0.75	-6.7	
CGN	7.25	3.38	Cognitronics Corp.	4.50	0.00	0.0	
CREAF	14.00	3.50	Creative Technology Ltd	5.88	1.13	62.4	
DACE	8.50	3.63	Data Race Inc.	3.63	0.25	3.4	
DTM	8.88	4.13	Datatron Corp.	3.81	0.31	4.2	
EMC	23.38	13.00	EMC Corp (H)	22.38	-0.88	-3.8	
EMLX	21.50	6.50	Emulex Corp	15.13	0.06	0.4	
ESCC	29.00	16.50	Evans and Sutherland	22.50	-0.25	-1.1	
EXBT	23.75	10.00	Exabyte	14.88	0.25	1.1	
ISLF	4.33	1.50	Intelligent Info Systems	1.94	-0.13	-6.1	
IOMG	55.13	2.75	Iomega Corp.	23.00	3.88	20.3	
IPLS	0.25	1.88	IPL Systems Inc.	1.13	0.06	3.0	
KMAG	37.00	13.63	Komag Inc.	22.25	-2.13	-8.7	
MTSI	22.21	11.75	Micro Touch Systems Inc	13.88	0.63	3.6	
PEAK	34.25	17.75	Peak Technology Group	22.50	-1.25	-5.3	
PMCL	19.75	4.88	Pinnacle Micro Inc.	5.75	0.13	2.2	
AQM	6.75	3.31	QMS Inc.	3.75	0.25	8.5	
QNTM	26.15	10.88	Quantum Corp	12.38	1.50	-7.3	
ROUSC	7.25	0.94	Radius Inc.	1.81	0.19	11.5	
SEG	61.75	38.13	Seagate Technology	54.00	-1.13	-1.0	
STK	44.13	21.75	Storage Technology	37.38	2.13	6.0	
STLC	8.75	1.25	Stratalonic Corp.	2.38	-0.53	-18.9	
TER	61.88	29.75	Teradyne Inc.	30.50	0.25	0.6	
WDC	41.25	14.38	Western Digital Corp (H)	20.25	0.25	0.6	
XRX	68.25	50.88	Xerox Corp	53.13	-1.25	-2.3	
AMSY	33 50	15 50	American Mgmt. Systems	28.63	-0.50	1.7	
ARLY	46 50	27 25	Analysys Int'l. (H)	46 50	1.00	2.2	
AUD	45 75	34.00	Auto Data Processing (H)	43.63	-2.00	-4.4	
BDMS	81.50	23.75	BD Mentertainment Inc. (H)	20.25	0.88	1.5	
CALP	33 25	13.88	Cambridge Tech. Partners (H)	32.75	-3.25	-9.0	
CEN	54.88	26.63	Cendant Corp	29.63	1.88	2.9	
CDO	29 50	18.88	Comdisco Inc	29.13	0.63	2.2	
CHRZ	54.00	11.63	Computer Horizons	28 50	0.50	1.8	
CSC	80.75	60.25	Computer Sciences	76.63	2.00	2.7	
TSK	33.00	14.63	Computer Task Group (H)	31.13	2.88	10.2	
CPU	34.88	12.38	CompUSA Inc.	52.63	0.25	0.5	
CDAT	27.50	10.13	Control Data Systems Inc.	22.75	0.25	1.1	
EGGS	13.88	5.00	Egghead Discount Software	6.00	-0.15	-2.0	
EDS	59.75	43.88	Electronic Data Systems Corp. (H)	58 50	-0.63	-1.1	
IMAC	34.88	9.13	Imacon Corp. (H)	13.94	2.19	6.9	
INEL	13.50	3.38	Intelligent Electronics	9.00	0.88	10.8	
KEA	67.75	18.25	Keane Inc.	66 63	1.13	2.5	
MSEL	6.25	1.88	Memsel	4.00	0.13	3.1	
MICA	18.50	7.25	Micronage Inc.	18.21	0.63	3.5	
PAYX	80.75	36.63	Paychex (H)	58 50	0.25	0.6	
PMS	53 50	34.88	Policy Management Sys.	34.88	1.75	-4.8	
REY	17.75	16.50	Reynolds and Reynolds	26.13	-0.50	-1.9	
SCIN	50 50	16.88	SCB Computer Tech Inc.	19.25	0.88	4.8	
SEIC	29 50	23.75	SEI Corp.	23.25	0.63	-2.6	
SMED	72.13	37.38	Shared Medical Systems	37.88	0.88	2.5	
SSPE	30.50	12.00	Software Spectrum Inc	20.00	1.00	3.6	
VST	26.00	9.00	VanStar Corp (H)	24.13	-1.50	-5.9	
SNDT	46.75	25.25	Sundard Dat 4 Systems	45.25	0.75	1.69	

KEY: (H) = New annual high reached in period; (L) = New annual low reached in period

Copyright Nobody International Inc., Boulder, Colorado

This information is based on sources believed to be reliable, but should extensive efforts are made to assure its accuracy, no guarantees can be made. Nobody International and Computerworld assume no liability for any inaccuracies. For information on Nobody's customized financial research services, call (303) 938-1877

How to contact Computerworld editors

Contacting us by phone
All editors can be contacted at our main phone number, (508) 879-0700, unless otherwise noted below. Our 24-hour news fax line is (508) 820-8555. For subscriptions, call (800) 669-1002, book terms, call (508) 820-8129, reprints, call (508) 820-8123. Our main fax number is (508) 875-8931.

Contacting us by E-mail
Our Web address is www.computerworld.com. All of our staff members can be reached via E-mail on the Internet using the form firstname_lastname@cw.com. For example, News editor Patricia Keefe is at patricia_keefe@cw.com. IDG News Service correspondents can be reached using the form firstname_lastname@idg.com. Subscription inquiries go to circulation@cw.com. Letters to the editor are welcome and should be sent to letters@cw.com. Please include your address and telephone number.

Contacting us by mail
Our postal address is PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701

Contacting Computerworld editors
We invite our readers to call or write with comments and ideas. It is best to submit ideas to one of the department editors as well as to the appropriate beat reporter.

Editor — Paul Gillin (508) 620-7714
Executive Editor — Maryfran Johnson (508) 820-8179

Department Editors/News
News Editor — Patricia Keefe (508) 820-8189
Deadline Editor — Johanna Ambrosio (508) 820-8153
Assistant News Editor — Paul Wallenberg (508) 820-8177
Assistant Deadline Editor — Kevin Fogarty (508) 820-8246
Associate Editor, News — Mitch Betts (206) 342-8718

Senior Editors/News
Enterprise computing, security — Mary K. Authers (206) 347-0434
Local-area networks, operating systems — Laura Dilon (508) 820-8180
Network management — Patricia Brydon (617) 320-5485
Application development — Frank Hayes (303) 252-0100
IS management — Thomas Hoffman (206) 587-0090
Telecom — John Gantz (508) 370-0330
Internet — Ellis S. Booth (714) 768-4281
Apple and PC software — Gina Poncelet (415) 347-6188
Databases — Craig Stedman (508) 820-8180
Internet — Mitch Wagner (415) 568-5213
Internetworking — Bob Wallace (508) 820-8214

Senior Writers/News
Mobile computing, wireless networks — Wendy Bounds (508) 820-8188
Databases, OLAP and storage — Mikael Ekblom (508) 620-7709
Computers, client/server software — Tim Dickinson (508) 820-8205
Enterprise databases, data warehousing — Julia King (508) 820-8202
Data and storage — Johnson Vijayan (508) 820-8220
PC software, workflow, imaging — April Jacobs (508) 820-8211
Application development — Sharon Gaudin (508) 820-8122

Staff Writers/News
@Computerworld — Thomas Hoch (508) 820-8133
Telecommunications — Ellis Booth (508) 820-8173
@Computerworld — Justin Hibbard (415) 568-5503
@Computerworld — Randy Weston (508) 620-7819
Client/server, peripherals, multimedia — Matt Hamblen (508) 820-8107

Opinions/Viewpoints
Technical Editor — Charles Babcock (415) 568-5301
Viewpoints Editor — Mitch Betts (508) 935-4718

Department Editors/Features
Technology review/Buyer's Guide — Jamie Connolly (508) 820-8144

Senior Editors/Features
Managing — Ellen T. Alter (508) 620-7714
In Depth — Steve Wexler (508) 820-7716
Corporate computing — Joseph Maglitta (508) 820-8190
Management — Robert L. Scheier (508) 620-7731
Careers — Beverly [illegible] (508) 820-8182
Reports/Briefs — Cathleen Gagne (508) 620-7719
Features & Investing — Rosemary Cafasso (508) 620-7815

Associate Editors/Features
Managing — Kim Tyler (508) 820-8208

Researchers
Bob Rich, senior research manager (508) 820-8202; Dana Gardner, senior researcher; Laura Hunt, research analyst; Amy Hughes, assistant researcher; Melinda McCann, senior graphics coordinator; Mark Verdi, Framingham bureau chief

Copy Desk
Ellen Pearlman, managing editor (508) 820-8179; Deborah Vozikis, assistant managing editor; Christine Accetta Maguire, senior copy editor; Michelle Bernstein, Kimberly Clifford, senior production copyeditors; Jamie Eaton, Pat Hyde, David Kastel, Jeremy Saltzer, copy editors; Monica Sambataro, online copy editor

Graphic Design
Tom Monahan, design director (508) 820-8208; Janet Dubreuil, Mike Hall, Hayes, Nancy Kaval, senior graphic designers; David Waugh, Mary Beth Welch, graphic designers; Bob Weiland, John Klossner, cartoonists

Administrative Support
Kristin Gagnon, office manager (ext. 8176); Connie Benoit (ext. 8178), Lorraine O'Neil (ext. 8179), Ellie Jones (ext. 8172), editorial assistants; Chris Flanagan, West Coast editorial assistant, (415) 568-5603

Computerworld Magazine Group
Christine Prendergast, Custom Editor, Best Places to Work, Leadership Series, Internet Series, Client/Server Journal, Electronic Commerce Journal and Virtual University Journals)
Alice Dragoon, editor (508) 820-8153; Mary Brandel, executive editor; Anne McCrory, California Bureau Chief; Joyce Chutchian-Fernand, managing editor; Maryellen A. Smith, assistant managing editor and editor operations; Shirley Fleischer, art director

IDG News Service Correspondents
Paris bureau chief — Marc Ferranti (33) 1-4965-8600
Polish correspondent — Jacqueline Deen (48) 1-6206-7837
Swedish correspondent — Thorsten Saeter (46) 8-632-3037
UK correspondent — Sam Cornelius (44) 181-460-1004
Tokyo correspondent — Bob Gatt, (81) 3-3556-1600
Tokyo correspondent — Yoshi Ichimura (81) 03-3556-1575

Companies in this issue

Page number refers to page on which story begins. Company names can also be searched at www.computerworld.com.

1-800-Network 98
3Com Corp. 1,24,56
3M Co. 6
ABN-Amro Services Co. **98**
Advanced Data Solutions 119
Aid Association for Lutherans . 83
Air Force Communications Agency 122
Air Handling Systems 61
Air Products & Chemicals 84
Alamo Rent A Car, Inc. 72
Amazon.Com, Inc. 2
Amdahl Corp. 12
America Online 93
American Association of Retired Persons 61
American Bar Association 41
American Foundation for the Blind 1
American Presidents Co. 72
Aris Corp. 16
Arizona State University 55
AT&T Corp. 14,29,64
AT&T Wireless Services 56
Australian Department of Employment 12
Autodesk, Inc. 28
BankAmerica Corp. **4**
BankAmerica International 10
Banyan Systems, Inc. 98
Bay Networks, Inc. 24
BBN Planet 64
Bell Atlantic Corp. 8,14
Bestdomains 61
Blenheim Group USA, Inc. 110
BMC Software, Inc. 14
Boffin Ltd. 42
Boots the Chemists Ltd. 55
Borland International, Inc. 29
Brokeragent 61
Brown Brothers Harriman & Co. 1
Buchanan, Ingersoll 61
Burlington Coat Factory Warehouse Corp. 6
Cabletron Systems, Inc. **8,24**
Candle Corp. 65
Cap Gemini America 73
Cascade Communications Corp. 93
Cellular One 56
Chase Manhattan Bank 119
Chemical Banking Corp. 119
Chicago Board Options Exchange 93
Chrysler Corp. 65
CIMWorld 65
Cincinnati Bell Information Systems, Inc. 12
Cisco Systems, Inc. 24,56
Citrix Systems, Inc. 4
CNet, Inc. 61
Compaq Computer Corp. 38,29,41,56
Computer Associates International, Inc. 10
Computer Horizons Corp. 69
Computer Sciences Corp. 28
Comshare, Inc. 52
Congress Financial Corp. 14
Consentini Associates 10
Convex Computer Corp. 119
Cray Computer Corp. 1,29
Cray Research, Inc. 29,122
Crossroads Technologies, Inc. 110
Crystal Services, Inc. 110
Cumid & Co. 26
Datalogix International **96**
Decisys, Inc. 8
Defense Advanced Research Projects Agency 8
Dell Computer Corp. 41
Dell'Oro Group 93
Deloitte & Touche 72
Denkart, Inc. 49
Digital Equipment Corp. 8,12,41
DMR Group, Inc. 29
Donaldson Co. 119
Donaldson, Lufkin & Jenrette Securities Corp. 29
Dun & Bradstreet 16
Dunlop Tire Co. 6
Electronic Data Systems Corp. **16**
Electronic Messaging Association 55
ELSA, Inc. 28
Enterprise Technologies Corp. 110
Equifax, Inc. 12
Express 64
Farm Credit Administration **83**
Federal Reserve Bank 1
Federal Trade Commission 84
Ferntree Computer Corp. 20
Fidelity Investments 52
First Interstate Bancorp 1
First National Bank of Maryland 8
Ford Motor Co. 65
Fore Systems, Inc. 28
Forrester Research, Inc. ..6,16,121
Frontier Technologies Corp. 61
Fujitsu Personal Systems, Inc. 41
Gartner Group, Inc. **20,29,76**
GE Capital Services Co. 20
GenCorp, Inc. 85
General Motors Corp. 65
General Services Administration 1,24
GigaLabs, Inc. 56
Glassco Park, Inc. 52
Goldman, Sachs & Co. 28
Hewlett-Packard Co. ..... **8,10,12 ..... 28,29,41,42,65,98,119**
Hickory Farms, Inc. 12
Hitachi Data Systems Corp. . 12,29
Hogan Systems, Inc. 1
Hoge, Fenton, Jones & Appel ...41
Hoosier Energy Rural Electric Corp. 1
Hurwitz Group, Inc. 49,55
Hydro Agri North America 16
I-Planet, Inc. **65**
IMet, Inc. 41
IBM ..... 1,2,4,8,12 ..... 14,28,29,41, ... 69,98,119
IDTech 110
Infinite Pictures, Inc. 52
Information Management Forum 12
Informix Corp. 2
Informix Software, Inc. 49
Insurance Services Offices, Inc. 41
Integrated Computer Solutions, Inc. 52
Intel Corp. 1,10,28,41
IntelliMatch 65
Intergraph Computer Systems, Inc. 28
International Data Corp. 4,12,14,49
Internet Engineering Task Force 56
Internet Multicasting Service 61
IPC Magazines Ltd. 69
Justesen, Combs & Peirier **65**
Kagan Telecom Associates **14**
Karlen Associates 81
Kaspia Systems, Inc. 56
Kraft Foods, Inc. 1
Lockheed Martin Corp. **8**
Logitech 122
Lotus Development Corp. 20,55,83
Lucent Technologies, Inc. 61,64
Macromedia, Inc. **61**
Manufacturers Hanover Trust 119
Marine Terminals Corp. 12
Market Data Group 83
Massachusetts Commission on the Blind 1
Maxm Systems Corp. 6
McDonald's Corp. 55
MCI Communications Corp. 14
Mentor Graphics Corp. 28
Mercury Research 28
Merrill Lynch & Co. 6
Meta Group, Inc. 2
Microsoft Corp. ... 1,2,6,8,14,78,29 49,50,52,55,61,64,83,98,121
Mobile Application Servers, Inc. 110
MovieFone, Inc. 61
National Libraries Service **1**
National Science Foundation .. 1,8
National Semiconductor Corp. 49
NationWide Insurance Co. 12
NCR Corp. 52,119
NEC Corp. 1
Netcom On-Line Communications Services, Inc. 93
Netscape Communications Corp. 1,2,6,24,61
Network Solutions, Inc. 61
Neuberger & Berman Management, Inc. 110
New Technology Solutions 1
New York Power Authority 93
Nexis-Lexis 29
Next Software, Inc. 2
Novell, Inc. 56,64,83
Nynex Corp. 14
Nynex Information Resources Co. 1
Object Management Group **6**
Online Marketing Partners 14
Open Market, Inc. 2,
Oracle Corp. 2,6,14,16,49,61,64
Ovum Ltd. 69
Pacific Telesis Group **14**
Park City Group 55
Patricia Seybold Group 55
Performance Computing, Inc. . 49
Phillips Petroleum Co. 6
Platinum Technology, Inc. 14
PRB Associates, Inc. 49
Precept Software, Inc. 61,64
Productivity Works, Inc. 1
Progressive Networks, Inc. 61
Proxim, Inc. 41
Prudential Insurance Company of America 69
QVC, Inc. **8**
Roadrunner Computer Systems 61
Rockwell International Corp. ... 72
Rogers & Wells 76
Rogue Wave Software, Inc. 49
San Diego Zoo **65**
SAP AG 16,28
Scholastic New Media 110
SES, Inc. 52
Sharp Electronics Corp. 41
Sheppard, Mullin, Richter & Hampton 83
Sherwood Research, Inc. 41
Silicon Graphics, Inc. ... 1,8,65,119
Smith Environmental Services, Inc. 28
Sony Pictures Imageworks 41
Southern Methodist University 55
Space Telescope Science Institute 12
Sprint Corp. 14,98
Starfish Software, Inc. 121
State Bar of California 41
State University of New York 12
Structural Dynamics Research Corp. 65
Summit Strategies, Inc. 1,119
Sun Microsystems, Inc. 1,8 12,16,28,29,41,49,119
Sybase, Inc. 2,14,49
Symantec Corp. 49
Tandem Computers, Inc. **1,12**
Taxware International, Inc. 64
Technology Business Research 119
The Atre Group, Inc. 4
The Burton Group 6
The Focus Group 65
The Linkage Group, Inc. 42
The North West Company 14
The Open Group 6
The Registry, Inc. 24
The Yankee Group 52,55
Time Warner, Inc. 61
Tivoli Systems, Inc. 8
Toshiba America Information Systems, Inc. 41
Trecom Business Systems 29
Tropic Tex International 49
Turner Broadcasting System, Inc. 55
U.S. Department of Energy ... **8,29**
U.S. Federal Trade Commission 83
United Nations 69
United Parcel Service of America, Inc. 72
Universal Underwriters Group ...81
University of Florida 8
University of Maryland 1
University of North Texas 12
University of Pennsylvania 6
USA.Net, Inc. 41
Vantive Corp. **14**
VDOnet Corp. 61
Vocatek Corp. 14
VXtreme, Inc. 61
Wake Forest University **55**
Walt Disney Co. 61
Warner Bros. Records 64
Weiss Associates, Inc. 81
Wells Fargo Bank 1
Xing Technology Corp. **61**

Datamart Face-Off

The 200 Fifth Club at the International Toy Center, New York City

Register by October 4, 1996

Full day's event for only $150

Looking for solutions to your organization's information bottleneck?

New York is the place to be on **October 15** to get face-to-face answers on the leading vendors' datamart product offerings at the **Datamart Face-Off.** Get details on what it takes to implement low-cost, simplified, rapid solutions to your data access problems. A **unique format** highlights three typical **customers' needs** — ranging from simple to complex — in the form of RFPs. Gather information to help you make critical decisions for your own organization as each vendor presents its complete **end-to-end solution** addressing these customer requirements. An **interactive setting** invites you to ask questions, challenge the experts and weigh the **pros and cons.** Don't miss the opportunity to evaluate technology solutions to specific problems and see these products in action.

Register today!

Participating Vendors

IBM · INFORMATICA · PLATINUM technology · SAS SAS Institute Inc.

Yes, I would like to attend the Datamart Face-Off being held on October 15, 1996 in New York for an all-inclusive fee of $150.

Name _____ Title _____ Company _____

Street _____ City _____ State _____ Zip _____

Phone _____ Fax _____ Email _____

Bring along a guest for an additional $125.

Name _____ Title _____ Company _____

Payment Method: ○ VISA ○ American Express ○ MasterCard ○ Check or money order (enclosed)

Credit card number _____ Expiration Date _____

Name as it appears on credit card _____ Signature _____

Event Sponsors: TBI · COMPUTERWORLD The Newspaper of IS

MAIL THIS COUPON TODAY OR FAX IT TO 201-573-9191. QUESTIONS? CALL CAROL ZENDT, 800-676-9470
Mail Address: TBI, 50 Tice Boulevard, Woodcliff Lake, NJ 07675

Wells Fargo takes risks to speed merger

CONTINUED FROM PAGE 1

banks, said Raphael Soifer, an analyst at Brown Brothers Harriman & Co. in New York. Analysts said they expect the speedy integration to result in $800 million in savings, with information systems contributing 10% to 20% of that.

The risks Wells Fargo's customer information group took — such as waiting for the deal to go through before launching an automated branch software distribution system — are based on a philosophy the IS group adopted in 1994 that rewards individuals for making mistakes.

"We weren't taking bold enough steps to accomplish what we needed," said Barry X. Lynn, executive vice president of the customer information group. So Wells Fargo adopted a program based in part oo the football adage that if you are being tackled, "fall forward" to gain an extra yard.

Now if a programmer makes a blunder, Lynn rewards him with a Falling Forward bicycle helmet.

Trail blazers

The program isn't unusual at a place that sponsors semiannual "mind expansion" workshops for IS executives. It is that kind of inaovative thinking that led the group to turn a deaf ear to industrywide security conceros and pioneer the most aggressive Internet-based banking strategy in the industry.

Key to the quick conversion was Wells Fargo's move three years ago to TCP/IP, which provides open network standards. The use of the Internet Protocol has "greatly reduced the amount of [integration] work they have to do," Soifer said. For example, the company was able to do the following:

- Oo April 1, Wells Fargo set up IP connections among its 1,140 First Interstate branches so customers could cash checks at either bank.
- Because both banks ruo their branch automatioo systems on IBM VSAM mainframe systems, Wells Fargo fouad it "easy" to write Cobol programs to transfer First Interstate's Hogan Systems, Inc. VSAM files to its homegrown branch automation system.
- When Wells Fargo transferred 500,000 First Interstate Visa debit-card accounts into its Tandem Computers, Inc. Himalaya systems this summer, there was no need to know which platform the Visa accounts were being run on, said Kenneth R. Chrisman, senior vice president of product delivery systems.
- The open network also enabled Wells Fargo to connect First Interstate's 776 California ATMs during one weekeod. Analysts said it normally takes months to establish oetwork connections for so many devices.

The hitches

Still, the bank's rush to gobble up First Interstate may have caused some of the hiccups that occurred along the way.

A data entry problem last month delayed the deposit of $40.3 million in paychecks and other payments to thousands of employees at the University of California and more than 100 other companies and institutions.

A capacity problem with 3Com Corp. router software earlier this month slowed Wells Fargo's IBM SNA network to a crawl, which prompted the bank to miss one of its FedWire deadlines. FedWire is an electronic system used by the Federal Reserve Bank to settle accounts among the nation's 11,000 banks.

The problem also shut down Wells Fargo's telephone banking system, which had handled 300,000 calls per day at the time the routers went into what Lynn called a "slow-path" mode.

Lynn insists the network glitches weren't merger-related. But a spokeswoman for 3Com said the router performance problems "were the result of bringing on a large number oew [First Interstate] customers."

Of course, such snafus are to be expected with any merger of this scale.

"If you took three years to do this [merger], you wouldn't have substantially more problems," Lynn said. Analysts agreed. "I've never seen an integration on this scale that didn't have some glitches," Soifer said.

Wells Fargo expects to integrate another 740 First Interstate branches and 4.7 million checking account customers in a region that stretches from Texas to Alaska by the end of November.

Chase prunes branches

The day after Labor Day, a Chemical Banking Corp. customer could walk into a Chase Manhattan Bank branch and cash a check or make a withdrawal.

Chase expects to take 13 months to combine 612 branches and 1,642 ATMs with Chemical, far longer than it will take Wells Fargo to complete its project with First Interstate. But Chase is nearly three times larger than Wells Fargo and has to unify several complex trading and wholesale applications.

Besides the IBM SNA networking connections it installed to make it possible for Chemical customers to bank at Chase branches, Chase's IS staff will be busy through next March integrating up to 300 retail software packages and tracking 2,300 networking milestones.

While Wells Fargo is making the First Interstate system comply with its own, Chase is using a suite selection process to determine which software applications will be used.

That strategy has already helped Chase save time. During Chemical's 1991 merger with Manufacturers Hanover Trust, it took IS managers six months to pick and choose among thousands of software applications.

Through suite selection, Chase was able to nail down its best-of-breed environment within 37 days, said Robert Brockbank, managing director of retail banking systems at Chase in New York.

The bank is spending $100 million to consolidate its branches; 100 are expected to be closed, Brockbank said. Real estate and other savings are expected to contribute $250 million toward the bank's goal of slashing $1.7 billion in costs, he said.

Much of that $100 million is tied to the rollout of 500 NCR Corp. servers and 10,000 NCR Pentium-based PCs.

— Thomas Hoffman

Unix vendors go for broke

Users win with more power, lower price

By Jaikumar Vijayan

Unix vendors are once again upping the ante in the technical server and workstation market.

Hewlett-Packard Co. last week introduced new desktop, deskside and server systems and refreshed some of its existing products with the recently announced 64-bit PA-8000 chip.

The news coincides with a spate of announcements expected from other major Unix vendors. Silicon Graphics, Inc., will announce a similar revamp of its entire product lineup (see story, page 1) in early October.

Unix systems

Sun Microsystems, Inc. last week announced a symmetrical multiprocessor (SMP) version of its Netra Internet server and plans to announce additions to its Enterprise server line.

Power play

"It is a kind of parry-and-thrust situation going on among these vendors" to gain an advantage, said James Green, an analyst at Summit Strategies, Inc. in Boston.

For users, the flurry of vendor activity will result in more powerful Unix boxes at more competitive prices, analysts said.

The highlights of HP's announcement last week include the following:

- The HP-Visualize B-class workstation based on the new PA-7300LC chip (see chart).
- The HP-Visualize C-class workstation based on the PA-7300LC chip with up to 1G byte of memory and up to 6G bytes of hard disk space.
- A new line of HP Exemplar technical servers that represent the integration of HP's technical server lines with technology from Convex Computer Corp., which it recently acquired.

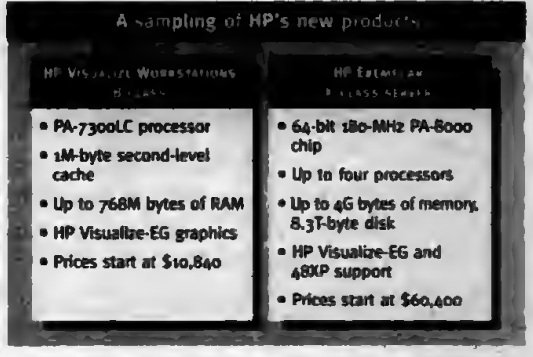
HP also has introduced a PA-8000 version of its J- and K-class servers and reduced prices by more than 50% on its low-end 712/715 line of workstations.

The major focus of HP's announcement is S- and X-class enterprise servers that integrate Convex technology. Based on the PA-8000 architecture, the SMP systems support from four processors on the S-class to 64 processors on the X-class. Similarly, memory scales from 16G to 64G bytes on the two systems.

"Systems like these enable HP to continue their thrust as a mainframe alternative company," said James Garden, an analyst at Technology Business Research.

"The marriage of HP and Convex has worked out real well for us — it fits in with what we are doing perfectly," said Gary Rocklitz, director of applied technologies at the corporate technology group of Donaldson Co. in Minneapolis.

Another user welcomed the PA-8000 architecture. "Since much of the processing we do runs from five days to a few weeks, we need systems that will really speed this process up," said Bill Kamps, manager of operations at Advanced Data Solutions, an oil and gas exploration firm in Houston.



Periodical postage paid at Framingham, Mass., and additional mailing offices. Posted under Canadian International Publication agreement #1487967. Computerworld (ISSN 0010-4841) is published weekly except a single combined issue for the last week in December and the first week in January by Computerworld, Inc., 500 Old Connecticut Path, Box 9171, Framingham, Mass. 01701-9171. Copyright 1996 by Computerworld, Inc. All rights reserved. Computerworld can be purchased on microfilm and microfiche through University Microfilms Inc., 300 N. Zeeb Road, Ann Arbor, Mich. 48106. Copy-forwarding is ordered. Back issues, if available, may be purchased through the circulation department. Photocopy rights: permission to photocopy for internal or personal use is granted by Computerworld, Inc. for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of $3.00 per copy of the article plus $.50 per page is paid directly to Copyright Clearance Center, 27 Congress Street, Salem, MA 01970. Reprints (minimum 500 copies) and permission to reprint may be purchased from Sharon Bryant, Computerworld, Inc., 500 Old Connecticut Path, Box 9171, Framingham, Mass. 01701-9171. Requests for missing issues will be honored only if received within 60 days of issue date. Subscription rates: $5.00 a copy; U.S. — $48 a year; Canada — $110 a year; Central & So. America — $150 (surface) a year; Europe — $295 a year; all other countries — $295 a year. Subscriptions call toll-free (800) 669-1002. POSTMASTER: Send Form 3579

You, Trying To Manage An Open Environment With Ordinary Storage.

You, Managing An Open Environment With EMC.

Is trying to maintain your open systems tearing you apart? Consider then, centralized, enterprise-wide storage from EMC. Our storage solutions let you consolidate and manage all your information from one place. They're scalable and work across leading platforms for highest performance. Not just with the UNIX and LAN servers you have now, but with those you add down the road. EMC storage also offers powerful protection against the loss of your mission-critical data.

Reliable, cost-effective and centralized, no wonder EMC is the leading supplier of independent storage to the open systems market. For more information on how EMC storage can help you keep it together, call 1-800-424-EMC2, ext. 225. Or visit us at http://www.emc.com.

EMC²

Free To Do More.

EMC² and THE STORAGE ARCHITECTS are registered trademarks and EMC is a trademark of EMC Corporation ©1996 EMC Corporation. All rights reserved.

'Perfect' is the enemy of 'good enough'

Why is the Internet so wildly popular? Is it because it offers a complete set of standards for supporting any corporate or consumer computing need? Because electronic mail does such a great job of moving huge attachments? Maybe it's because users immediately understand what a DNS does and why they need one.

Obviously not. The 'net isn't yet suited to much you might actually want: Sending attachments is hell, and isn't D&S something they do in San Francisco?

No, the reason the 'net has become such a phenomenon — besides most users' belief that access is free, or nearly so — is because it's "good enough." It's not great, oot even exceptional, just good enough to get the job done.

And guess what? Paying more attention to "good enough" could keep software companies and internal developers out of trouble.

Throughout the personal computing era, vendors have made incredible promises and then moved on before making good. A classic example is Microsoft Exchange, the E-mail system that Microsoft's Laura Jennings (now head of The Microsoft Network) told me would ship maybe four years ago.

Instead, the product seemed to fall into feature creep. The first version was for Windows 3.x, but before it could ship, Windows 95 appeared. And then the Internet happened. By not getting a version out the door early, Microsoft kept getting swamped with new demands, pushing the ship date out even further. Now these aren't stupid people, and I can't think of any reason why Microsoft would intentionally put itself through this. So we can only believe the company just couldn't get a product out the door that lived up to its promised feature set.

My friend Philippe Kahn uses the phrase, "Shipping is a feature" as a response when I hand him my most-wanted list of features for Starfish Internet Utilities, made by Kahn's Starfish Software, Inc. And he has a point: What good is a product that never gets into users' hands? At some point, you just have to say, "Ship the damn thing," and move on to the next release.

It would be easier for software publishers to do this if they didn't overpromise so much. Corporate developers do the same thing. Instead of figuring out what meets the requirements of, say, 80% of the intended users, then building and shipping that, they go for the engineering and design awards and never quite get the product out. Worse, if it finally does leak out of the lab, it's so late that users now need something else, and the process begins again. This is what happened to a friend, a client/server developer at a big airline, who kept tinkering and tinkering until he almost tinkered himself out of a job.

Having been suckered by too many products that went for the gold and never made it to the finish line, let me suggest an alternative: Go for the bronze, or even the stainless. Just get a stable, well-designed product that's good enough out to users. Then build the features they request and move on to the next major release. I, for one, have given up my search for perfection and will settle for something that really works.

Coursey is an analyst, consultant and editor of "coursey.com," a "good enough" online newsletter found at www.coursey.com. Does the search for perfection get in the way at your shop? Drop Coursey a note at david@coursey.com.

Intranet building collides with security

From the mailroom to the boardroom, there's agreement that an intranet is going to get built — if it isn't already under construction.

But in IS back offices, there's fierce debate over whether an intranet will be both functional and secure.

If it were up to security managers, intranet services might wait a little longer as IS staffers figure out what combination of measures best protects the corporation.

But IS can't wait; top management won't let them. There are business partners knocking on the door, and potential customers are being lost to competitors because they already have access to someone else's intranet.

Does it matter to a customer that he can place an order electronically with a preapproved credit-card number? Of course. It takes days off the delivery cycle. Sometimes the product is software, and it gets delivered immediately over the wire.

So IS, very determined not to get caught in a foot-dragging posture once again, is rushing ahead. And therein lies the problem.

Intranets must be built using TCP/IP, the internetworking protocol that drives the Internet. There really isn't any other choice. TCP/IP can be made to work with any network you may already have in-house. By using TCP/IP, you can use on your intranet all the products and servers built for the Internet.

In a recent report, Forrester Research concluded that "over the next four years, the rapid development of rich TCP/IP-based services will propel the intranet well beyond document-sharing. These services will tear away any proprietary network operating system advantage." In another report, Forrester Research predicts that strategically placed Internet Protocol switches will dominate LANs of the future to handle increasing Internet downloads and relieve multiprotocol complexity. (IP is the tail end of TCP/IP. It has the specifications that determine how data is transferred across the 'net, while TCP establishes process-to-process connection between two computers.)

Customers and business partners will be connected via the emerging TCP/IP intranet. But IS knows that TCP/IP is inherently insecure. It became the internetworking protocol because it followed specified standards and evolved in the public arena. Its workings are well-known. Unlike the mainframe/SNA environment, there are no inherent barriers to intruders.

So IS will have to authorize these outside parties to enter through the firewall and access the company's inventory, ordering and billing systems — even a system that shows the status of third-party accounts. IS can require each outside user to submit individual users' names in writing, then confirm them through their supervisor. These users can be assigned IDs and passwords to access specific servers, although that job must be done manually for each server. All these measures are barely maintaining control.

IS doesn't know if the passwords it gives out are going to be used by just one person. It knows a determined intruder can probably get inside the firewall and into applications where he has no business.

But there's little choice. Until security becomes as high a priority as connecting to the customer, certain risks will have to be embraced.

Babcock is *Computerworld*'s technical editor. His Internet address is charles_babcock@cw.com.

alt.cw

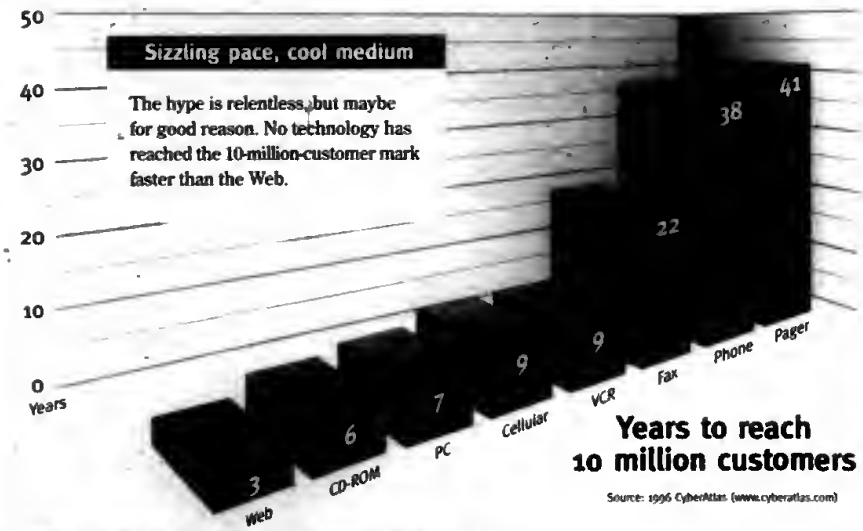
The Sea World and Busch Gardens theme parks recently joined the ranks of businesses online at www.4adventure.com. Here, a sea otter from Sea World in Orlando, Fla., tries to figure out how to work a mouse and keyboard with paws instead of hands.
— Mitch Wagner

The Chicago Fire Department plans to replace its old, but reliable, telegraph system with a $217 million computerized dispatching center later this year, the Dow Jones News Service reported.

Col. Patrick Ryan, commander of the Air Force Communications Agency, said he cut public access to the agency's Web site because, "We were getting a lot of hits from China and North Korea," *Federal Computer Week* reported.

Researchers at Cray Research in Eagan, Minn., found the largest known prime number while testing a Cray T94 supercomputer. The number has 378,632 digits, enough to fill 12 newspaper pages, the Bloomberg news wire reported. A prime number is evenly divisible by itself and the number one.

Mouse maker Logitech in Fremont, Calif., has unveiled the SurfMan cordless controller for untethered World Wide Web surfing. The three-button, thumb-operated device uses low-frequency radio signals that can pass through obstacles and permit Web browsing from up to six feet away. It costs $99.



Inside Lines

Big Blue plans big product blast

IBM next week plans to announce wide array of new and enhanced internetworking products, *Computerworld* has learned. Among them are the optical Wave Length Division Multiplexer, which lets users link data centers up to 50 kilometers away over a 20-channel fiber, sources close to IBM said. The firm also will unveil the N-way Multi-Access Concentrator, which pushes multiprotocol traffic across wide-area network links at near-Asynchronous Transfer Mode (ATM) speeds; and two products that work with its LAN switches to deliver video to the desktop. IBM also will announce Source Route Bridging support for its Token Ring products, and High Performance Routing support for its 3172 controller and 3746 front-end processor. ATM interfaces are also due for the 3172, the sources said. IBM confirmed the plans.

ARCO not pumped up about Notes

Watch out for those highly touted deals vendors love to use as examples that their products are installed at the largest companies. Atlantic Richfield (ARCO), which last spring publicly committed to replace its electronic-mail systems with Lotus Notes 4.0 as an enterprisewide messaging and groupware system, has yet to install one seat of Notes 4.0. A spokesman for the Los Angeles petroleum giant said Notes installation has been put off for at six to nine months. The spokesman had no further details.

Amiga back from the dead?

New Star, an Amiga computer clone, hit the streets in Taiwan for less than $200. That's well below the $500 target for a network computer, and the Amiga system includes storage and other features forsaken by network-dependent designs.

Yabba Diba do

A hapless publicist at network computer vendor Diba learned something about Internet E-mail etiquette last week after a carelessly configured mass-mailing created a discussion group instead of just delivering a Diba press release. Reporters who replied to the original release by asking to be unsubscribed from the mailing list had their responses copied to the other reporters on the list, not just to Diba. Pretty soon the list was buzzing as reporters exchanged gossip, fished for freelance work or asked to *please* be removed from the chit-chat circle. And all of it was on Diba's dime. One correspondent noted, "I just had a vision of 100 publications all carrying exactly the same brief story about Diba screwing up their E-mail lists."

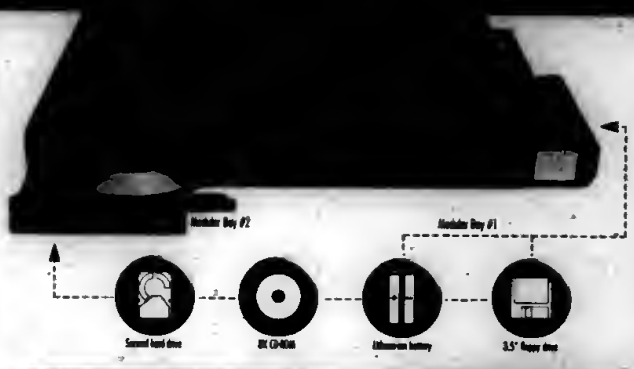
Replication of a different kind

Database administrators trolling through the comp.databases.oracle Usenet newsgroup last week were treated to a lengthy and bawdy tale about a teen-age boy's loss of innocence. The posting of the story, which was titled "The Bad Girl," prompted heavy flaming of the person whose E-mail address was attached to the document. He later posted a message denying authorship. He claimed his online identity had been used nefariously by an unknown fraud. The story was deleted from the newsgroup listing in short order.

Friends forwarded us a Top 10 list (source unknown) of reasons why the Presidential debates won't take place on the World Wide Web. Here are some of the best reasons: Perot's crack hackers could get him in. None of the candidates is hip enough for the Web. Hillary won't let the president in a chat room. Dole's Selectric won't connect to the 'net. Chelsea is using the White House PC to write a book report. And the No. 1 reason: In cyberspace, no one can feel your pain. But Computerworld *feels your pain. So go ahead and send your gripes and tips to news editor Patricia Keefe at (508) 820-8183 or patricia_keefe@cw.com.*

PC MAGAZINE

HOW CAN SOMETHING SO FAST HANDLE SO WELL?



It's In The Steering.

Portable computing moves into the fast-lane with two exclusive features from Micron Electronics. The Pick-a-Point™ dual pointing device gives you a choice of controls—touchpad or pointing stick. The FlexOpt™ dual-bay modular design lets you mix and match devices for a variety of customized performance-enhancing choices. You can drop in a modular CD-ROM drive for multimedia capability, add a second intelligent lithium-ion battery for up to 8 hours use without recharging*, or a 2.1GB hard drive to increase your storage capacity. The **Millennia TransPort** even has an infrared port for walkup and wireless printing from compatible printers. And don't forget the industry-leading Micron Power™ warranty. Drivers, start your engines!

*Actual battery performance will vary depending on applications and configurations. Based on two 4-hour batteries.

Millennia TransPort

Standard Features

- Mobile Intel Pentium® processor
- Intel 430MX PCI chipset
- 256KB L2 pipeline burst cache
- 16MB EDO memory (48MB max.)
- 8X modular CD-ROM drive
- PCI graphics accelerator, 1MB EDO memory
- Pick-a-Point™ dual pointing devices integrate both pointing stick and touchpad
- Removable EIDE hard drive
- 3.5" modular floppy drive
- Intelligent modular lithium-ion battery
- 16-bit stereo sound
- Built-in stereo speakers and microphone
- 2 Type II or one Type III PCMCIA slots
- S-video and NTSC-video outputs
- Headphone, microphone and line-in jacks
- 2 infrared ports, one front, one back
- Parallel, serial, VGA and 2 PS/2 ports
- Dimensions: 11.7" x 9.4" x 2.0", 6.9 lbs.†
- Nylon carrying case
- Microsoft® Windows® 95 and MS® Plus! CD
- Microsoft Office Pro 95 and Bookshelf® 95 CDs
- Kensington™ security lock ready‡
- 5-year/3-year Micron Power™ warranty

†6.9 lbs. includes 3.5" floppy and one battery
‡Lock secures both Millennia TransPort and MicronDock

intel inside pentium

Designed for Microsoft® Windows®95

- 133MHz Mobile Intel Pentium® Processor
- 16MB EDO memory (48MB max.)
- 12.1" active matrix color display, 800 x 600
- 1.2GB removable hard drive

$4399
Business lease $150/mo.

- 133MHz Mobile Intel Pentium Processor
- 32MB EDO memory (48MB max.)
- Motorola® Montana 28.8 fax/modem
- 12.1" active matrix color display, 800 x 600
- 1.2GB removable hard drive • 2nd lithium-ion battery

$5199
Business lease $163/mo.

- 150MHz Mobile Intel Pentium Processor
- 32MB EDO memory (48MB max.)
- Motorola Montana 28.8 fax/modem
- 12.1" active matrix color display, 800 x 600
- 2.1GB removable hard drive
- 2nd lithium-ion battery • Samsonite® leather carrying case

$5550
Business lease $174/mo.

Options

- With 150MHz Mobile Intel Pentium processor ..... add $200
- With 16MB DIMM module upgrade ..... add $349
- With 32MB DIMM module upgrade ..... add $749
- With primary 2.1GB hard drive upgrade ..... add $100
- With 2nd removable hard drive (1.2GB) ..... add $599
- With 2nd removable hard drive (2.1GB) ..... add $699
- With 3Com® Ethernet 10BT PCMCIA ..... add $149
- With Motorola Montana 28.8 fax/modem ..... add $259
- With MicronDock™ multimedia port replicator ..... add $299
- With MicronExec™ desktop package ..... add $799

Micron Power

- 5-year limited warranty on microprocessor and main memory
- 3-year limited parts-only system warranty
- 1-, 2-or 3 year optional on-site service agreement for Micron desktop systems
- 30 days of free Micron-supplied software support for Micron desktop systems
- 30-day money-back policy
- 24-hour technical support

Terms and conditions of sale may vary by specific configuration. Copies of the limited warranties may be obtained on our Web site or by calling Micron.

MICRON ELECTRONICS, INC.

800-776-4505

http

900 E. Karcher Road, Nampa, ID 83687 • Mon-Fri 6am-10pm Sat 7am-5pm (MST) • International Sales Hours: Mon-Fri 6am-7pm (MST) • 208-893-3434 • Fax: 208-893-3424 • Purchase Order Fax: 208-893-8992
Technical Support Available 24 Hours A Day—7 Days A Week • Technical Support E-mail: techsupport.micronpc.com

©1996 Micron Electronics, Inc. All rights reserved. Micron Electronics is not responsible for omissions and/or errors in typography or photography. All purchases are subject to availability. Prices and specifications may be changed without notice. prices do not include shipping and handling. 30-day money-back policy does not include return freight and original shipping/handling charges. applies only to Micron brand products and begins from date of shipment. All sales are subject to Micron Electronics, Inc.'s terms and conditions of sale. Lease prices based on 36-month lease. Intel, Intel Inside and Pentium are registered trademarks of the Intel Corporation. Microsoft, Windows, Windows NT and the Windows logo are registered trademarks of Microsoft Corporation. All other service marks, trademarks and registered trademarks are the property of their respective companies. TPMS-CMYO-000000

C O M P U T I N G W I T H O U T L I M I T S

THE PC MANUFACTURERS SEEM TO HAVE A HARD TIME EXPLAINING WHY THEIR MEMORY COSTS SO MUCH MORE THAN OURS.

Since Kingston® memory is virtually identical to the PC manufacturers', the difference in price is hard to explain. You see, Kingston starts with the same components and the same specifications the system manufacturers use. Then our engineers optimize the design of each module to suit the system in which it will be used. So compatibility is assured. Finally, to ensure reliability, we test every cell on every chip on every module. On a 16 megabyte module, that's 128 million cells. And, unlike most PC manufacturers, we also provide a lifetime guarantee. Yet Kingston has always cost a lot less, almost 50% less in some cases. And now we're cutting our prices even further. Why not give us a call? (800) 533-8714. We'd be glad to explain how much you can save with Kingston.

Kingston TECHNOLOGY

For more information call us at (800) 533-8714 ISO 9001 *Visit our Web site: http://www.kingston.com/cw.htm*

Kingston Technology Company, 17600 Newhope Street, Fountain Valley, CA 92708 USA, (714) 435-2600, Fax (714) 435-2699. © 1996 Kingston Technology Company. All rights reserved. Kingston is a registered trademark and Computing Without Limits is a trademark of Kingston Technology Company. All other trademarks and registered trademarks are the property of their respective owners.